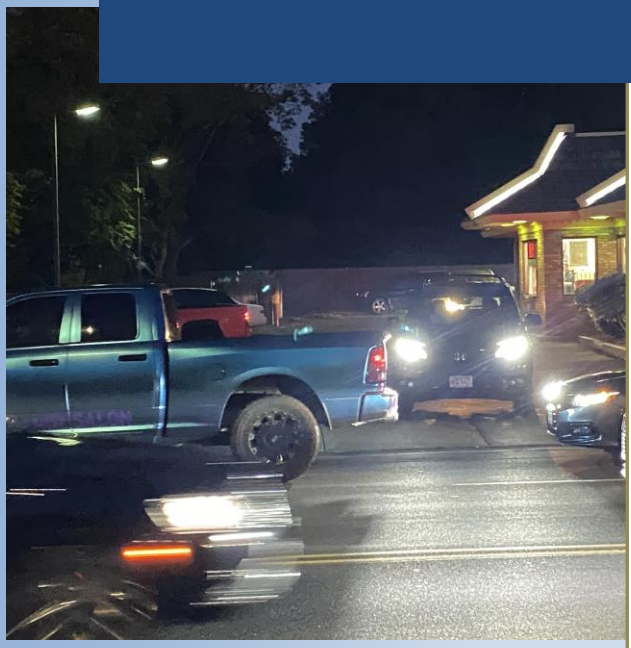
**This report—by concerned residents of Reading, MA—responds to the McDonald's-commissioned study concluding that the proposed new double drive-through restaurant at 413 Main Street would have a "negligible" traffic impact. This report finds traffic could double based on the site plan configuration combined with McDonald's restaurant automation technologies, mobile app usage, marketing efforts, and other factors not mentioned in the McDonald's study.**



# McDonald's: Severe Traffic Impacts from a Double Drive-Through plus Mobile Marketing and AI/Automation Technologies

# Contents

# 1 Executive summary

Through late October, approximately 100 Reading residents had signed a petition asking McDonald's to withdraw its plan to reconstruct a double drive-through restaurant at 413 Main Street. The signers ask that McDonald's partner with the Town and create a lower-traffic mixed-used development appropriate to this site, which sits at the gateway to our walkable downtown just two blocks from the Reading MBTA station. McDonald's can still make profits while aligning with Town goals.

Meanwhile, the existing McDonald's proposal is still active and undergoing site plan reviews before Reading's Community Planning & Development Commission (CPDC).

This report challenges the traffic study commissioned by McDonald's. That study, conducted by McMahon engineering, concluded that the traffic impacts of the project would be less than one additional car every five minutes and that this change would be "negligible." [1] Following public comment on Oct. 16, 2023, the CPDC discussed the need for peer review on this study.

In that spirit, this report

- describes numerous factors, including technological ones, that will drive additional traffic but were not analyzed or mentioned in the McMahon report;
- demonstrates why a doubling of traffic is an apparent objective of McDonald's, and is also likely to occur; and
- provides a data request to McDonald's to help CPDC and the community better understand potential traffic impacts.

The stakes are enormous for downtown Reading.

- Nearby intersections on Main Street are already at a traffic "level of service" of "F," the worst grade, with continual traffic tie-ups at peak times.
- McDonald's may already be the single biggest traffic generator downtown.
- If a doubling occurred, peak weekday midday trips—in one hour—would soar from the McMahon estimate of 173 trips (each in and out visit counts as two trips) to 346 trips.
- This condition could persist for decades.

[1] https://www.readingma.gov/DocumentCenter/View/12025/04---McDonalds-Reading_Traffic-Assessment_2023-04-26-PDF

## 1.1 The McDonald's traffic study did not analyze the proposed drive-through changes in the site plan or discuss the company's market research data or advances in automation

The study performed by McMahon for McDonald's (referred to here as the McMahon study) did not actually count traffic at the existing McDonald's. It also did not describe how doubling the number of drive-through lanes of the proposed site plan for 413 Main would affect traffic. Instead, it used a reference manual aggregating counts from other jurisdictions, and based estimates of additional traffic based on the modest increase in the square footage of the proposed restaurant.[2] Additionally, the McMahon study:

- did not cite data from comparable McDonald's redevelopment projects with similar drive-through changes, even though such data should be available;
- did not mention that traffic dictions at intersections just north and just south of the restaurant are already at an "F" condition and how this condition might impact restaurant traffic or vice versa; and
- did not include any discussion or analysis of factors and technology trends that will affect traffic flows at 413 Main, including:
    - **Company goals and motivations:** McDonald's objectives are to increase sales, revenue, and customer traffic as it invests $6 billion in restaurant reconstruction.
    - **Marketing data:** McDonald's, the world's largest fast-food chain, has sophisticated marketing strategies. It also has the nation's most-downloaded fast-food app.
    - **Automation data:** McDonald's is devising new strategies to speed and increase vehicle throughput, including via dynamically-changing signs and AI-driven voice ordering.
    - **Delivery services and in-app sales:** Services such as Uber Eats and Door Dash, as well as in-app purchases, create new flows of traffic from drivers who do not need to first stop to make orders.

Section 2 discusses the existing congestion; Section 3 discusses the above factors.

[2] The study's numbers come from the Institute of Transportation Engineers' (ITE) publication, Trip Generation Manual, 11th Edition, published in 2021. Per the McMahon report, this "provides traffic generation information for various land uses compiled from studies conducted by members nationwide. This reference establishes vehicle trip rates (in this case expressed in trips per square foot) based on actual traffic counts conducted at similar types of existing land uses…. vehicle trip generation estimates for the existing and proposed McDonald's sites were developed using Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window)."

# 2 Existing conditions along Main Street near McDonald's are already badly congested, with restaurant traffic backing up onto Main Street

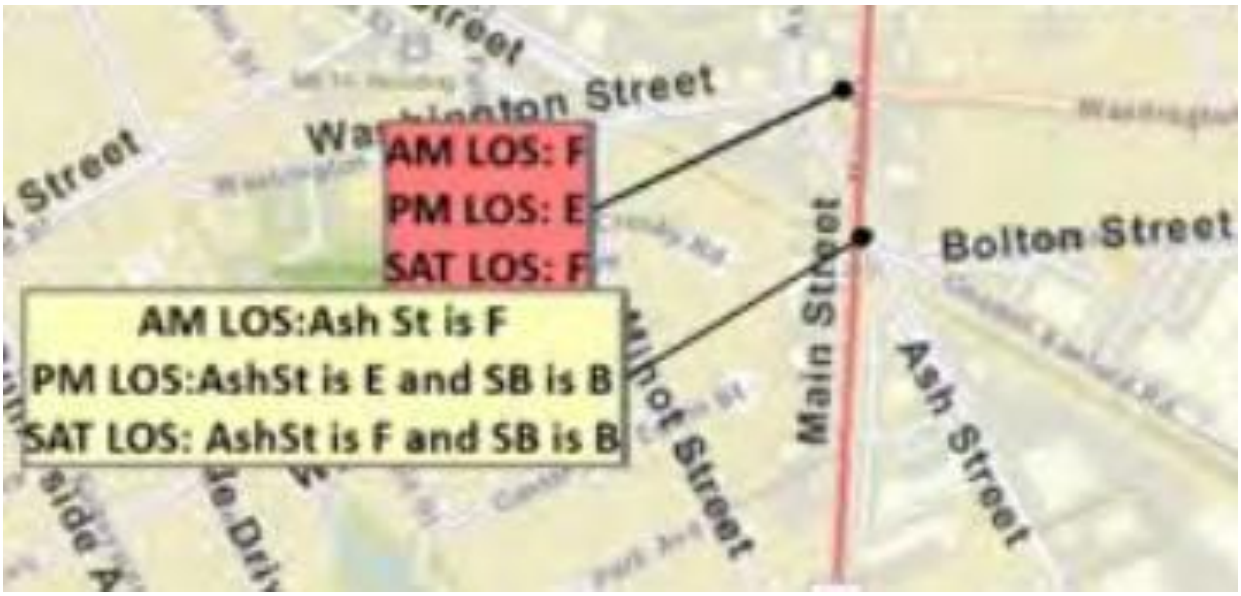
The following two subsections document existing congested conditions and the role of the existing McDonald's restaurant in creating those conditions.

## 2.1 An earlier report by a Town consultant reported that the "level of service" in this area is already an "F"

A recent Town-commissioned study performed by Green International Associates, and released in 2021, documented that the intersections at Washington and Main, and at Ash and Main – just north and south of McDonald's—are already at an "E" or "F" [3] as shown in the figure below.

Traffic engineers classify traffic conditions on an "A" through "F" scale for the "level of service" (LOS). A site with an LOS of "F" means that every vehicle moves in lockstep with the vehicle in front of it. Roads that face near-constant traffic jams are at a level of service of F.

**Figure 1: Existing Traffic at Nearby Intersections are Already at the Worst Level of Traffic Service**




During the Oct. 16 public hearing, CPDC Chair John Weston commented that McDonald's is probably the largest traffic generator in downtown Reading. Actual numbers for the existing restaurant are not available to the community or to CPDC.

Given that the restaurant sits directly between two intersections already designated "F," it is reasonable to consider that the restaurant is playing a role in this "F" level traffic. Yet the

[3] https://www.readingma.gov/DocumentCenter/View/7924/Walkers-Brook-Corridor-Analysis--Final-Deliverable-392021-PDF?bidId=

McMahon study did not discuss these current conditions or the possibility that McDonald's contributes to them now or might worsen them in the future.

## 2.2 McDonald's traffic study reports that existing peak traffic is already backing up onto Main Street

The McMahon study did include some important observations, if not actual traffic counts. The report made the following comments about existing back-ups at Main Street.

- "A five-vehicle pick-up queue occurred multiple times during each of the observation periods, which would obstruct ordering operations until pick-up queues were cleared. ***On one occasion during the Saturday midday peak period, vehicles were queued back to the site driveway on Main Street, briefly obstructing the potential for vehicles to enter the site*.** (emphasis added)
- "During the weekday midday, weekday afternoon, and Saturday midday drive-thru count periods, the vehicle queue on Main Street extending back from the signalized intersection with Washington Street was reviewed. ***The queue was frequently observed to extend past the McDonald's driveway and temporarily obstruct entering and exiting access*.**" (emphasis added).

The McMahon study (quoting the ITE, not actual traffic counts at 413 Main) reported these estimated current traffic flows. (These are vehicle trips, where the entry and exit of one car counts as two trips.) The report noted that some vehicles entering fast-food restaurant drive-throughs are spontaneous visitors who were already passing by.

**Existing Traffic to McDonald's During Certain Peak Hours (per McMahon)**

| **Weekday Midday Peak Hour** | | Total (portion from pass-by traffic) | **Weekday PM Peak Hour** | | Total (portion from pass-by traffic) | **Saturday midday Peak Hour** | | Total (portion from pass-by traffic) |
|---|---|---|---|---|---|---|---|---|
| In | Out | | In | Out | | In | Out | |
| 88 | 85 | **173 (96)** | 58 | 54 | **112 (64)** | 96 | 92 | **188 (104)** |

# 3 McDonald's investment plans, site plan, and trends in marketing and AI and automation could drive a doubling of traffic through the site

A number of factors and technologies could double traffic at 413 Main. More data would help improve this analysis.

## 3.1 McDonald's is investing $6 billion to reconstruct restaurants and naturally wants to drive higher traffic and revenue

Five years ago, McDonald's announced that it would spend $6 billion to renovate most of its 14,000 U.S. restaurants.[4] Some projects are renovations or facelifts; others are complete razing and reconstruction projects. The 413 Main project falls into the latter category.

McDonald's is the world's largest fast-food company. Like any company, McDonald's wants to increase revenue and increase customer visits. McDonald's uses data to drive its decisions. The decision to spend $6 billion presumably resulted from analyses that such an investment would not only achieve a payback, but also significant profits from additional traffic and revenue.

CEO Chris Kempczinski said in a memo earlier this year that the company had created new demand and wanted to "capture" this extra demand through its restaurant program. "We must accelerate the pace of our restaurant openings to fully capture the increased demand we've driven over the past few years," Kempczinski said in the memo.[5]

McDonald's is investing in a variety of efforts designed to increase and speed traffic throughput. This includes site changes, increased drive-through capacity, and menu boards that can change dynamically to speed the passage of cars, as discussed in later subsections.

## 3.2 The new restaurant is engineered to double vehicle throughput relative to the existing restaurant

The new McDonald's site plan is engineered to process at least twice as many vehicles.

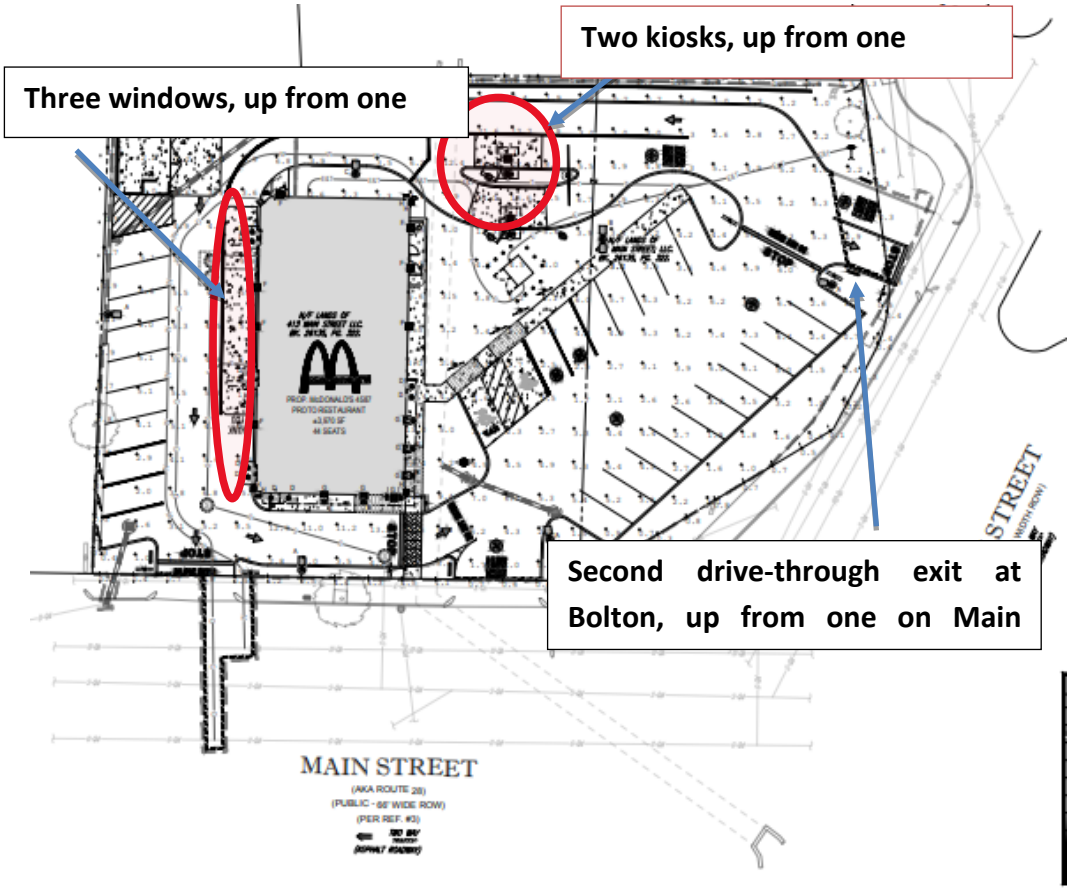
- The existing McDonald's has one ordering kiosk. The new one would have two ordering kiosks**—twice as many**.

[4] McDonald's plans $6 billion makeover of its restaurants - CBS News https://www.cbsnews.com/news/mcdonalds-plans-6-billion-makeover-of-its-restaurants/#:~:text=McDonald%27s%20on%20Tuesday%20announced%20a%20%246%20billion%20plan,allow%20for%20table%20service%20and%20%22refreshed%22%20exterior%20designs.

[5] McDonald's plans reorganization, job cuts as it accelerates restaurant openings (cnbc.com) https://www.cnbc.com/2023/01/06/mcdonalds-plans-reorganization-job-cuts.html

- The existing McDonald's has one window to both pay and pick up food. The new one will have three windows—**three times as many**. (The first will be for payment, which is speedy with credit cards, and the second and third are for food pickup.)
- The existing McDonald's has two entrances but only one exit for drive-through traffic, onto Main Street. The proposed McDonald's would have two drive-through exits—**twice as many**. McDonald's proposes to allow cars to wind around and exit at Bolton.

**The Plan is Engineered to Handle Double the Vehicle Traffic**



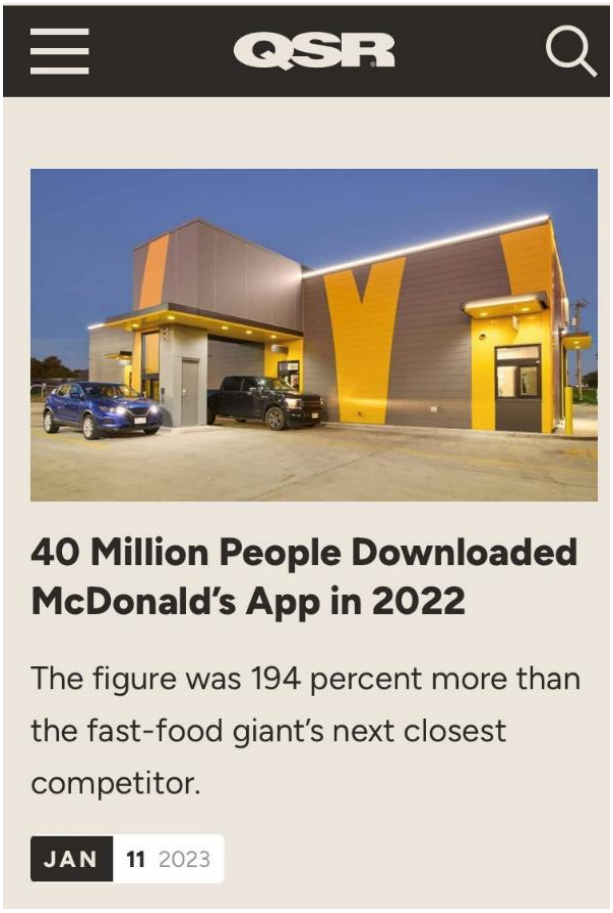

Given the McDonald's consultant's observation that exiting traffic already backs up on Main Street at times, is reasonable to infer that McDonald's foresees the one Main Street exit becoming gridlocked from new traffic, necessitating the second drive-through exit.

It is reasonable to infer that's McDonald's choice to handle double the number of vehicles also reflects the company's actual goal for the site.

## 3.3 Customer use of fast-food drive-throughs is increasing, and McDonalds is investing heavily in mobile marketing technologies to draw drivers to its restaurants

According to published reports, drive-through visits account for a larger share of fast-food sales than ever before. In some markets, the drive-through business represents 70 percent of McDonalds' sales, and the fast-food giant is seeking to increase throughput rates. [6]

In 2022, McDonald's mobile app was the world's most-downloaded "quick service restaurant" app, with 40 million downloads in the United States alone. That figure roughly corresponds to 20 percent of the U.S. population between ages 16 and 64—and does not include downloads in other years. [7]




It's conservative to assume that one in five cars contains a phone with the McDonald's app installed. Reading's I-93/I-95 interchange sees 375,000 vehicles per day.

It is reasonable to assume that McDonald's is using app data and other market research data to guide investment decisions, including the decision to engineer 413 Main Street to handle twice as many vehicles on the site.

The McDonald's app:

- Provides pop-up notifications (such as with special offers and sales) to users who allow such notifications

[6] The Future of McDonald's Is in the Drive-Thru Lane | WIRED https://www.wired.com/story/mcdonalds-drive-thru-mymcdonalds-app/

[7] 40 Million People Downloaded McDonald's App in 2022 - QSR Magazine https://www.qsrmagazine.com/growth/consumer-trends/40-million-people-downloaded-mcdonalds-app-2022/

- Advises users where to go to find the nearest McDonald's, so long as users enable the app to see their location. For such users, anyone on I-95 can potentially receive guidance to go to 413 Main. Highway billboards also advertise the McDonald's site.
- May offer in-app purchasers a dedicated parking space. This entices drivers ordering from smartphones, such as from area highways, to pick up their pre-paid food as they might do at a highway rest stop.


**Billboard before Exit 56B directs drivers to the McDonald's at 413 Main, the only Reading drive-through advertised on I-95**

## 3.4 Beyond a doubling: McDonalds is investing in ways to speed throughput with dynamic signs and AI-based voice ordering

The new restaurant is likely to implement new technologies to speed trips through the site. This speedier pass-through will thus create the potential for traffic to contribute to, or exceed, a doubling.

For example, in 2019, McDonald's bought two AI (artificial intelligence) companies whose technologies are designed to speed vehicle throughput and, as such, total vehicle traffic. [8] The companies are:

- **Dynamic Yield**, which dynamically changes digital menu ordering boards based on what AI models predict customers will want—potentially increasing sales and speeding the process. McDonald's spent $300 million to buy this company. An electronic ordering board is the subject of a special permit application before CPDC. (There would be two of them, because there are two ordering kiosks.) The role of this technology in affecting traffic in downtown Reading has not yet been explored.
- **Apprente,** which builds AI-based voice technology for rapid, reduced-error fast-food order taking. The voice at the kiosk is generated by AI and could result in faster throughputs and, therefore, higher traffic volumes.

[8] McDonald's Acquires Apprente to Double Down on Tech | WIRED https://www.wired.com/story/mcdonalds-acquires-apprente-voice-ai/

## 3.5 In-app purchases and delivery services such as Uber Eats enable faster throughput and more vehicle trips

Beyond deploying AI to speed throughput, other trends and strategies will allow McDonald's to move vehicles through the site more quickly, thus enabling traffic to theoretically go beyond a doubling.

Two examples:

- Customers who order online or through the app may not have to stop at the ordering or payment windows, speeding their trip.
- Customers who use delivery services like Uber Eats would also indirectly cause faster traffic through the site, because the driver does not have to stop to order or pay.


**The McDonald's at 413 Main promotes pickup from mobile app purchases and delivery services**

# 4 Conclusion: Traffic to and through the McDonald's site may double under the proposal, and technology advances may enable traffic to go beyond this doubling

McDonald's seeks to build a restaurant meant to handle twice the number of vehicles and has the means, consumer data, deep bench of app downloads, AI/automation technologies, and the motivation to achieve a doubling of traffic to make ROI and drive profits.

The following table illustrates what numbers would be produced by a doubling during peak hours, and what would happen if a further 20 percent throughput was gained by a combination of AI/automation advances and pre-paid purchases.

**Table 1: Traffic Numbers if Site Design Capacity is Met Through McDonald's Marketing**

| **Weekday Midday Peak Hour** | **Weekday PM Peak Hour** | **Saturday midday Peak Hour** |
|---|---|---|
| Total in/out (portion from pass-by traffic) | Total in/out (portion from pass-by traffic) | Total (portion from pass-by traffic) |
| Existing<br><br>**173 (96)** | Existing<br><br>**112 (64)** | Existing<br><br>**188/104** |
| DOUBLING<br><br>**346/192**<br><br>If 20% throughput increase from AI/tech: **415/230** | DOUBLING<br><br>**224/128**<br><br>If 20% throughput increase from AI/tech: **269/192** | DOUBLING<br><br>**376/208**<br><br>If 20% throughput increase from AI/tech: **451/250** |

# 5 Data Request to McDonald's

The McMahon traffic report was written from a reference manual without any examination of what is actually proposed in the site plan before CPDC, any data from McDonald's, or any discussion of the impacts of new technologies.

Concerned residents of Reading are requesting that McDonald's withdraw this proposal and pursue a mixed-use option. Meanwhile we make the following data request to McDonald's:

1. Please provide data on before-and-after drive-through traffic figures from the most recent five restaurants where a 1970s-style single-kiosk, single-window, single-exit restaurant was replaced with a two-kiosk, three-window, and two-exit restaurant with the new dynamic kiosk and AI voice ordering technologies.
2. Provide data on numbers of drive-through visits to the site at 413 Main Street. Please provide all available data from all years.
3. Do you plan to reserve one or more parking spaces for drivers making in-app purchases and/or for delivery service drivers?
4. Overall, what are your predictions and/or objectives for speeding travel time and total traffic for drive-throughs at this site if this proposal is built?
5. From your mobile analytics data, provide data on
    a. how many people are using smartphones—whether through the app or the website--to find 413 Main. Include data on where they are coming from and how many originated on interstate highways. Please provide daily and annual numbers for the past 5 years.
    b. how many people are actually purchasing meals through the app and then driving to 413 Main just for pickup. Please provide daily and annual numbers for the past 5 years and how many are coming from interstate highways.
6. How many purchases are made by delivery services, such as Door Dash and Uber Eats that visit 413 Main? Please provide daily and annual data from all years available.
7. What does your research data show about the effect of dynamic kiosk signage on reducing traffic throughput times and increasing traffic numbers?
8. What does your research data show about the effect of AI-based voice ordering on reducing throughput times and increasing traffic numbers?

9. How long does it take, on average, for a drive-through customer to get through and make a purchase at 413 Main Street? Please provide annual average data from the last 5 years showing any improvements.
10. What promotions do you expect to make for the new restaurant at 413 Main, and what levels of additional traffic do you expect to result from these promotions?