



11.A/13.A

To: Township Board

From: Mark Kieselbach, Director of Community Planning and Development
Keith Chapman, Assistant Planner

Date: December 3, 2020

Re: Commercial Planned Unit Development #20-13034 (Meridian Mall Limited Partnership)

Meridian Mall Limited Partnership has submitted a request to amend the commercial planned unit development (C-PUD) approval for the Meridian Mall. The development plans include constructing a 2,500 square foot bank building on a proposed 1.36 acre parcel located east of the primary entrance off Grand River Avenue. The 94.30 acre Meridian Mall site is zoned C-3 (Commercial) and is located at 1982 Grand River Avenue.

The Planning Commission held the public hearing on the C-PUD request at its November 9, 2020 meeting and voted 6-1 to recommend approval at its November 23, 2020 meeting, citing the following reasons for its decision:

- The subject site meets the 2017 Master Plan goal 3A to upgrade commercial areas by utilizing the Commercial Planned Unit Development Ordinance.
- Public water and sanitary sewer serve the subject site.

Staff memorandums outlining the C-PUD request and minutes from the Planning Commission meetings at which the request was discussed are attached for the Board's review.

Township Board Options

The Township Board may approve, approve with conditions, or deny the proposed C-PUD. If the Board amends the proposal, the request may be referred back to the Planning Commission for a recommendation. A resolution will be provided at a future meeting.

Attachments

1. Staff memorandums dated November 6, 2020 and November 19, 2020 with attachments.
2. Resolution recommending approval dated November 23, 2020
3. Planning Commission minutes dated November 9, 2020 (public hearing) & November 23, 2020.

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To: Planning Commission

From: Peter Menser, Principal Planner
Keith Chapman, Assistant Planner

Date: November 6, 2020

Re: Commercial Planned Unit Development #20-13034 (Meridian Mall Limited Partnership)

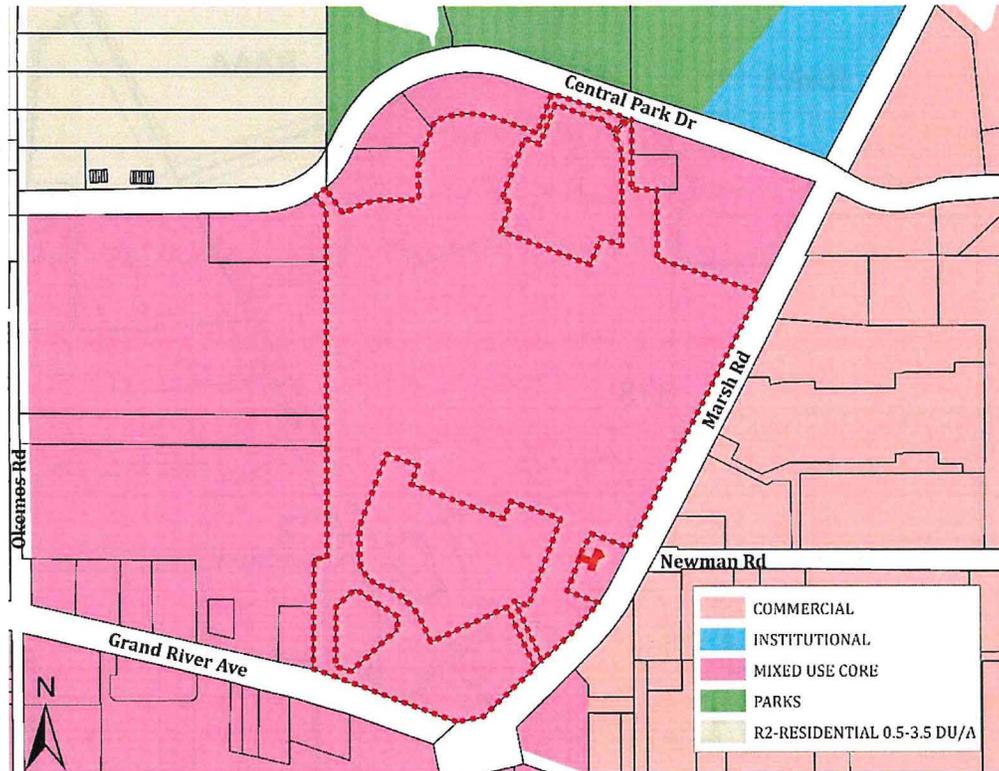
Meridian Mall Limited Partnership has submitted a request to amend the commercial planned unit development (C-PUD) for Meridian Mall. A C-PUD was established for Meridian Mall in 2013 (C-PUD #13034) for an 18,650 square foot addition to the former Gordmans tenant space and the establishment of two future building sites totaling 18,000 square feet in size adjacent to Central Park Drive. A C-PUD amendment was approved in 2019 for the removal of a 2.43 acre parcel from Meridian Mall's C-PUD and the addition of a four acre parcel for the Meridian Township Farmers Market. The 94.30 acre Meridian Mall site is zoned C-3 (Commercial) and is located at 1982 Grand River Avenue. The Mall property contains frontage on Grand River Avenue, Marsh Road, and Central Park Drive.

The applicant is proposing to construct a 2,500 square foot bank building on a proposed 1.36 acre parcel located along Grand River Avenue, east of the primary entrance off Grand River Avenue. For C-PUDs any building addition that is located outside of a building envelope as shown on the approved C-PUD is considered a major amendment.

Master Plan

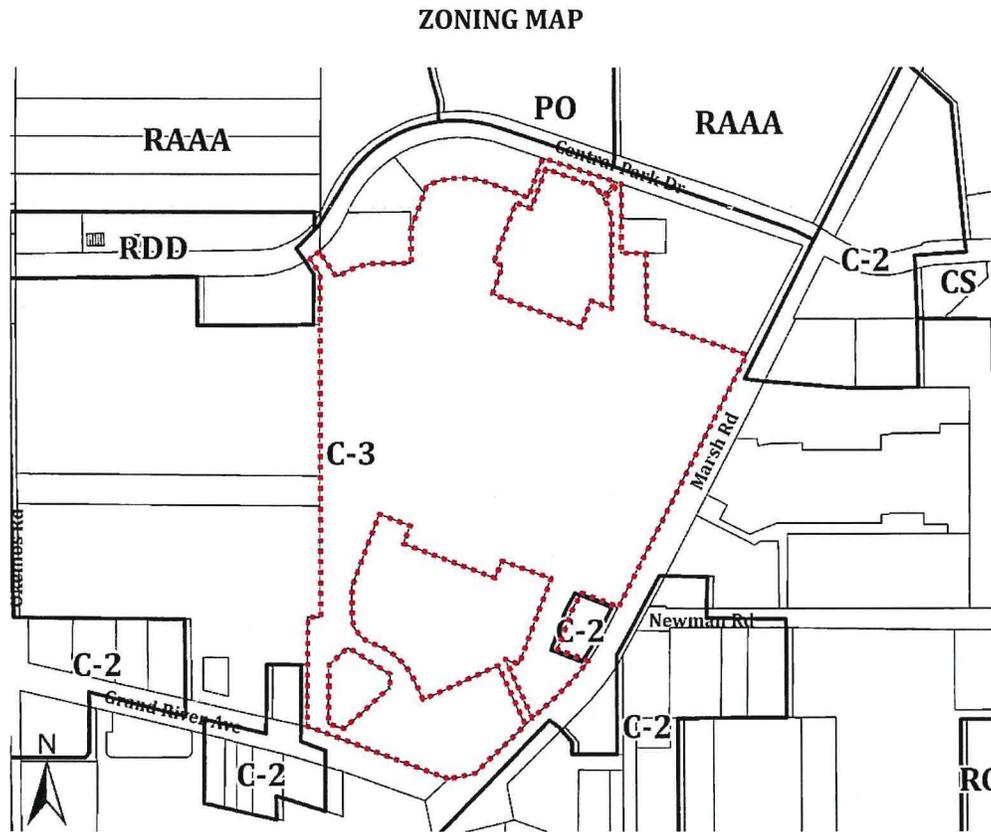
The Future Land Use Map from the 2017 Master Plan designates the subject sites in the Mixed Use Core category.

FUTURE LAND USE MAP



Zoning

The subject properties are zoned C-3 (Commercial). The entire Meridian Mall site meets the C-3 zoning district requirements for 100 feet of lot frontage and 10,000 square feet of lot area. With 243.07 feet of lot frontage on Grand River Avenue and 1.36 acres (59,241.6 square feet) of lot area the proposed parcel meets the minimum standards for both lot area and lot width of the C-3 zoning district.



Physical Features

The Township Wetland Map and the Flood Insurance Rate Map indicate neither wetlands nor floodplain are present on or near the site of the proposed building. The site has no special designation on the Township Greenspace Plan.

Streets and Traffic

Mall entrances are located on Grand River Avenue (1), Marsh Road (3), and Central Park Drive (3). A ring road provides internal access around the Mall. A service drive connects the Mall site with an adjacent multi-tenant retail center to the west (Best Buy and Office Max). A seven foot wide pedestrian-bicycle pathway is present along Grand River Avenue. The submitted site plan shows a proposed seven foot wide bicycle/pedestrian connection to Grand River Avenue along the east property line of the future bank property.

A traffic impact study is required if the project will exceed 100 vehicle trips during peak hours. A traffic assessment was submitted by the applicant that was conducted by TADi Traffic Analysis & Design, Inc. Based on the applicant's traffic consultant the proposed addition does not increase the number of vehicle trips to the extent a traffic impact study is required.

Staff Analysis

The C-PUD process mirrors that of the mixed use planned unit development (MUPUD) process, with public hearings held by both the Planning Commission and Township Board. The Planning Commission makes a recommendation on the project with the Township Board having final approval.

Following is a summary of the project's consistency with the C-PUD ordinance standards. As part of this project analysis, standards for the underlying C-3 zoning district and other requirements applicable to development in the C-3 district will be compared to what is proposed on the submitted site plan.

Land use: All uses permitted by right and by special use permit in the underlying C-3 zoning district are permitted in a C-PUD. The proposed land use is a bank with drive-through.

Performance objectives: Minimum C-PUD performance objectives include the following:

- *Provide good internal and external access to the street for pedestrians and bicycles* – a painted cross walk is proposed to connect pedestrians and bicyclists to the building from the pathway along Grand River Avenue to the bank.
- *Minimize environmental impacts by using green building and site development standards* – the submitted site plan does not indicate whether environmental impacts will be minimized.
- *Enhance access to alternative transportation modes including public transportation* – the subject site is located along CATA routes 1, 22, and 23.
- *Use of quality building materials* – generally, building materials in a C-PUD should include, but are not limited to, wood, brick, clapboards, beadboard, glass, and stone. Other materials such as vinyl, aluminum, and other metal sidings should be avoided. All buildings should be completed on all sides with acceptable materials. The design of the building should relate to and blend with the facades of adjacent buildings and complement streetscape improvements in the area. The proposed building material for the bank is a combination of a brick masonry system, stone, and metal paneling.
- *Provide for buffering between any conflicting feature of the design and an adjacent residential land use* – the site is surrounded entirely by commercial land uses.
- *Adherence to smart growth principles* – the proposed project is an example of an infill development and is located within the Urban Services Boundary.
- *Preference for parking located in the rear or side yard* – the setbacks for a parking area and the number of parking spaces required can be waived in a C-PUD. 14 parking spaces are required for the project and the applicant is proposing 25 parking spaces. Parking is located in the front, rear, and side yards.

Railings, benches, trash receptacles, or bicycle racks: Accessory items such as railings, benches, trash receptacles, or bicycle racks shall be of commercial quality and complement the building design and style. Information on proposed bike racks, railings, benches, trash receptacles, or other accessory items will be reviewed during the Site Plan Review process.

The following section summarizes other aspects of the project:

Bicycle parking: One bicycle parking space is required for every ten motor vehicle parking spaces required. There are 14 parking spaces required; therefore the project must have a minimum of one bicycle parking spaces. The bike rack will be required to be shown on the plan during Site Plan Review.

Landscaping: Proposed landscaping must generally comply with the provisions of the Code of Ordinances. Section 86-758 of the Code of Ordinances outlines the typical landscape requirements for off-street parking areas including landscaped islands at least ten feet in width, building perimeter landscaping at least four feet in width, a minimum of 200 square feet of interior landscaping for every ten parking spaces, and two interior canopy trees per ten parking spaces. Section 86-473 provides standards for street trees. A landscape plan was provided and building perimeter landscaping will be required to be shown during Site Plan Review.

Outdoor lighting: The C-PUD ordinance requires site lighting to comply with the Outdoor Lighting Ordinance (Section 38-371). A photometric plan was submitted and will be reviewed in detail during site plan review if the C-PUD is approved.

Parking

The parking requirement for retail shopping centers consisting of more than 600,000 square feet of gross leasable area is 5 spaces for every 1,000 square feet of gross leasable floor area. The C-PUD established 4.52 parking spaces for every 1,000 square feet of gross leasable floor area, or a total of 4,466 parking spaces. The proposed building will add 25 parking spaces, increasing the parking spaces to 4,491.

Impervious Surface

C-3 zoned sites are allowed 70 percent impervious surface coverage. The C-PUD established coverage at 82.54 percent impervious and 17.46 percent pervious. After the construction of the bank, the Mall's impervious surface coverage would be 81.05 percent, 1.49 percent under the amount granted by the C-PUD.

Waiver requests

The C-PUD ordinance is intended to provide flexibility for the Planning Commission and Township Board to set appropriate standards during the review process. The C-PUD ordinance generally waives the standard requirements for lot size, setbacks, number of required parking spaces, building perimeter landscaping, and impervious surface coverage, provided the purpose and intent of the ordinance is incorporated into the overall development plan. Based on the submitted site plan the applicant is requesting the following waivers for the project:

Bypass Lane

A vehicle bypass lane is required along the outside of the drive through lanes. The submitted site plan shows three drive through lanes with no bypass lane and is therefore requesting a waiver to have no bypass lane.

Amenities

One or more amenities are required for every C-PUD project. Examples of amenities are grouped into categories in the zoning ordinance, which include conservation, environment, accessibility, parks, recreation and culture, social interaction, and site and building design. If multiple amenities are shown, the ordinance suggests they should represent multiple categories. Criteria to determine whether a proposed amenity is acceptable for consideration are found in Section 86-444(e)(2) of the C-PUD ordinance.

Sheet 8 of the submitted site plan shows the proposed amenities for the project, including connection to the pedestrian-bicycle pathway along Grand River.

Planning Commission Options

The Planning Commission may recommend approval, approval with conditions, or denial of the C-PUD. A resolution will be provided at a future meeting.

Attachments

1. Commercial planned unit development amendment application and attachments dated October 13, 2020 and received by the Township on October 13, 2020.
2. Traffic Impact Assessment prepared by Traffic Analysis & Design, Inc. dated October 12, 2020 and received by the Township on October 13, 2020.
3. Site Plan prepared by Kebs, Inc. dated October 28, 2020 and received by the Township on November 5, 2020.
4. Building elevations prepared by vocon dated September 29, 2020 and received by the Township on October 13, 2020.
5. Photometric Plan and Lighting Cut Sheets prepared by Michigan Lighting Systems dated July 24, 2020 and Received by the Township on October 13, 2020.

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CHARTER TOWNSHIP OF MERIDIAN
DEPARTMENT OF COMMUNITY PLANNING AND DEVELOPMENT
5151 MARSH ROAD, OKEMOS, MI 48864
PHONE: (517) 853-4560, FAX: (517) 853-4095

COMMERCIAL PLANNED UNIT DEVELOPMENT APPLICATION

Before submitting this application for review, an applicant shall participate in the pre-application conference with the Director of Community Planning and Development to discuss the requirements for a Commercial Planned Unit Development.

Part I

- A. Applicant Meridian Mall Limited Partnership
Address of Applicant c/o CBL & Associates Management, Inc, 2030 Hamilton Place Blvd, #500, Chattanooga TN 37421
Telephone - Work 423-490-8649 E-Mail david.neuhoff@cblproperties.com Fax _____
Interest in property (circle one): Owner Tenant Option Other _____
(Please attach a list of all persons with an ownership interest in the property.)
- B. Site address / location / parcel number 1982 W. Grand River, Okemos
Legal description (please attach if necessary) see plan
Current zoning C-3
Project name Meridian Mall Re-Development
- C. Developer (if different than applicant) _____
Address _____
Telephone: Work _____ E-Mail _____ Fax _____
- D. Architect, Engineer Planner or Surveyor responsible for design of project if different from applicant:
Name KEBS, INC.
Address 2116 Haslett Rd, Haslett, MI, 48840
Telephone(s) (517) 339-1014 E-Mail jkyes@kebs.com Fax _____
- E. Acreage of all parcels in the project: Gross 94.3 Net _____
- F. Proposed Uses and Site Amenities:
1. Use(s)
 - a. Type(s) Additional Bank
 - b. Gross Floor Area See Plan
 - c. Usable floor area See Plan
 - e. Number of employees Varies
 - f. Hours of operation Varies
 3. Number of Parking Spaces Required: see plan
Number of Parking Spaces Proposed: 4,491
 4. Proposed Amenities: Type additional 7' walk connection
Type see plan for existing amenities
Type _____
Type _____
- G. The following support materials must be submitted with the application:
1. Nonrefundable fee.
 2. Legal Description of the property. (A sealed survey may be required)

3. Evidence of property ownership or a letter from the property owner authorizing the request submitted with proof of property owner from the author of the letter.
4. A site analysis indicating the principal factors which influenced design decisions. The analysis shall include but need not be limited to: soil conditions, topography, surrounding land uses, and surrounding pedestrian and vehicular circulation systems.
5. If the project is to be phased, a document generally describing the proposed phasing program.
6. A written request identifying each waiver and each amenity.
7. A map drawn to an engineer's scale of the total property showing its location in the township and its relation to adjacent property.
8. A reproducible two foot contour topographic map based on United States Geological Survey (USGS) drawn at the same scale as the site plan and showing existing relief features on the site.
9. A schematic layout of the proposed storm sewer system.
10. Site Plans: 16 copies (Fifteen (15) 24"x36" and one 8½" x11") of a Site Plan drawn to a readable scale containing the following (may be a multiple site plans for readability):
 - Total property, its location in the Township, its relationship to adjacent properties
 - Boundaries of subject property
 - Location and dimensions of all existing and proposed structures
 - Approximate location and distance of all structures within 100 feet of the subject property
 - Proposed means of vehicular and pedestrian ingress and egress to the subject property
 - Public and private roads and streets, rights-of-way and easements indicating names and widths of streets which abut or cross the site
 - Existing and proposed parking spaces and vehicular and pedestrian circulation patterns
 - Dimensions of setbacks from streets, property lines and between buildings on the site
 - Location of proposed amenities
 - Location and size of existing utilities including power lines and towers, both above and below ground
 - Amount and location and calculation of all impervious surfaces
 - Verified boundaries of all natural water features and required setback lines
11. Building elevations (all sides) drawn to scale and in color. Elevations should be accompanied by material samples or a display board of the proposed exterior materials and colors.
12. A Traffic Study (if the project will exceed 100 vehicle trips during the peak hours of the roadway(s), prepared by a qualified traffic engineer, based on the most current edition of *Evaluating Traffic Impact Studies: A Recommended Practice for Michigan Communities*, published by the State Department of Transportation.
13. Natural Features Study for previously undeveloped properties which includes a written description of natural features proposed to be retained, removed, or modified. Natural features shall include, but are not limited to, wetlands, floodways, floodway fringe, waterbodies, significant stands of trees or individual trees greater than 12 inches dbh, identified groundwater vulnerable areas, slopes greater than 20 percent.
14. A lighting plan (see Chapter 38, Article VII).

15. Copies of comments from reviewing agencies such as, but not limited to, the following:
- Ingham County Road Commission
 - Ingham County Drain Commission
 - Michigan Department of Transportation (if applicable)
 - Michigan Department of Environmental Quality (if applicable)

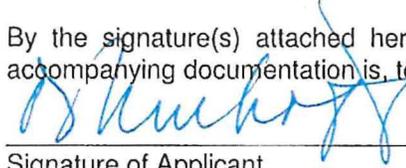
H. Any other information specified by the Director of Community Planning and Development which is deemed necessary to evaluate the application.

Part II

I (we) hereby grant permission for members of the Charter Township of Meridian's Boards and/or Commissions, Township staff member(s) and the Township's representatives or experts the right to enter onto the above described property (or as described in the attached information) in my (our) absence for the purpose of gathering information including but not limited to the taking and the use of photographs.

Yes No (Please check one)

By the signature(s) attached hereto, I (we) certify that the information provided within this application and accompanying documentation is, to the best of my (our) knowledge, true and accurate



 Signature of Applicant

9.25.2020

 Date

David Neukhoff

 Type/Print Name

Fee: _____

Received by: _____

Date: _____

Pre-Application Meeting Held: _____
 Date

Application Complete: _____
 Date

By: _____
 Staff

TIA TECHNICAL MEMORANDUM

Date: October 12, 2020

Prepared for: David Neuhoff
CBL & Associates Management, Inc.

Prepared by: Tammi Czewski, P.E., PTOE
Traffic Analysis & Design, Inc.

Subject: **Meridian Mall Bank Traffic Impact Assessment**
Meridian Charter Township, MI

INTRODUCTION

A new bank is proposed to be constructed on an outlot for the Meridian Mall in Meridian Charter Township, Ingham County, Michigan. The outlot is located just north of Grand River Avenue on the south side of the mall property (see Exhibit 1). Per the Meridian Township requirements, a Traffic Impact Assessment (TIA) report was prepared for this development. A TIA report is typically required for proposed uses that are expected to generate 50-99 trips during the peak hour or 500-749 trips daily. The proposed bank is expected to generate 51 trips during the peak hour.

STUDY AREA

Study Intersections

Based on discussions with Meridian Township planners, the study intersections evaluated in this TIA include the following intersections:

- Grand River Avenue & western Meridian Mall driveway – traffic signal control
- Grand River Avenue & eastern Meridian Mall driveway – stop sign control

The existing geometrics, traffic control, posted speed limits, and distances between study intersections are shown on Exhibit 2.

Study Area Roadways

Grand River Avenue, also designated as M-43, is an east/west roadway that is classified as a Principal Arterial. Grand River Avenue has a five-lane cross-section (two through lanes in each direction and a two-way center left-turn lane) and a 45-mph speed limit. There are

pedestrian sidewalks along both sides of Grand River Avenue. According to the Michigan Department of Transportation, the estimated 2019 annual average daily traffic (AADT) on Grand River was 11,020 just west of the Meridian Mall driveway. MDOT shows that this AADT is relatively the same (but declining slightly) from AADT volumes reported in 2017 and 2018.

The Meridian Mall driveway provides access from Grand River Avenue to the Mall Drive ring road around the Meridian Mall building. The driveway splits in a Y-shape at Grand River Avenue. The west leg is signalized at Grand River Avenue for eastbound left-turns entering and southbound right-turns exiting the Meridian Mall. The east leg operates with stop sign control at Grand River Avenue for westbound right-turns entering and southbound left turns exiting the mall driveway. There are no sidewalks for pedestrians along this driveway. Opposing this driveway is the Meijer development driveway leading to the Meijer gas station and the Belle Tire outlet.

DATA COLLECTION/PEAK HOUR TRAFFIC VOLUMES

Traffic Counts

TADI collected weekday turning movement traffic counts for this study at the Grand River Avenue intersection with the Meridian Mall driveways on Thursday, October 1, 2020. Traffic counts were collected for both the east and west legs from 6:00-8:00 a.m. and from 4:00-6:00 p.m. Based on the data collected (included in Appendix A), the peak hours at the study intersections occur from 8:00-9:00 a.m. (AM peak hour) and from 5:00-6:00 p.m. (PM peak hour). The existing 2020 peak hour turning movement counts were compiled for these hours and are shown on Exhibit 3.

During the count, no delay or queueing issues were reported at the signalized west leg of the Meridian Mall driveway, but eastbound traffic queues from the signalized Grand River Avenue/Marsh Road intersection periodically backed up through the Meridian Mall east leg driveway during the weekday PM peak hour. These queues occurred in the center turn lane/eastbound left-turn lane for traffic turning north onto Marsh Road and cleared during each eastbound left-turn phase at the traffic signal.

Traffic Adjustments

At the time of the traffic counts, area public schools and Michigan State University were educating students in a virtual format due to the ongoing Covid-19 Pandemic. Although most retail and industrial businesses were open and operating as normal, many employees in office-type businesses were working from home. For these reasons, the existing 2020 traffic counts collected at the study intersections are lower than pre-Covid conditions.

The MDOT hourly traffic data on Grand River Avenue, just west of the Meridian Mall driveway was reviewed to determine the difference in traffic volumes between the MDOT count collected in 2017 and the recent count collected in 2020. The comparison shows that the eastbound 2017 traffic volumes on Grand River Avenue were higher than in 2020 by 30% in the AM peak hour and by 35% in the PM peak hour. The westbound 2017 traffic volumes on Grand River Avenue were higher than in 2020 by 105% in the AM peak hour and by 3% in the PM peak hour. The 2020 turning movement counts at the study

intersections were increased by these percentages to normalize the existing counts to 2017 levels. No further traffic volume increases (such as background traffic growth to 2021) were added since MDOT AADT forecasts showed no growth between 2017 and 2019 data. The factored peak hour traffic volumes at the study intersections are therefore shown as the Year 2021 Background Traffic Volumes on Exhibit 4.

PROPOSED DEVELOPMENT

Site Plan

The conceptual site plan for the proposed bank is shown on Exhibit 5. The bank is planned to be constructed on a vacant outlot on the Meridian Mall property. The bank building would encompass about 2,500 square feet and have two drive-through teller lanes and one ATM lane. Two access driveways are proposed to connect to the south side of Mall Drive. Twenty-five parking spaces will be provided on site for customers and employees. Buildout is expected in 2021.

Trip Generation

Trips for the proposed bank were based on trip rates published in the ITE *Trip Generation Manual, 10th Edition*. The trip generation table for the proposed bank is shown in Table 1. The 2,500 square foot bank is expected to generate 324 weekday daily driveway trips, with 24 trips in the AM peak hour and 51 trips in the PM peak hour. An estimated 10 percent of these driveway are expected to be linked with other land uses on the Meridian Mall property, and an estimated 35 percent of the remaining trips are expected to be pass-by trips from traffic traveling along eastbound and westbound Grand River Avenue.

Table 1. Trip Generation Table

| Land Use | ITE Code | Proposed Size | Weekday Daily | AM Peak | | | PM Peak | | |
|--------------------------------------|----------|---------------|---------------|-------------|-------------|--------------|-------------|-------------|---------------|
| | | | | In | Out | Total | In | Out | Total |
| Drive-in Bank | 912 | 2,500 SF | 324 FCE | 14 (58%) | 10 (42%) | 24 (9.50) | 26 (50%) | 25 (50%) | 51 (20.45) |
| Total Driveway Trips | | | 324 | 14 | 10 | 24 | 26 | 25 | 51 |
| <i>Minus Externally Linked Trips</i> | | | -32 | -1 | -1 | -2 | -3 | -3 | -6 |
| <i>Minus Pass-by Trips</i> | | | -102 | -4 | -4 | -8 | -8 | -8 | -16 |
| Total New Trips | | | 190 | 9 | 5 | 14 | 15 | 14 | 29 |

Trip Distribution

The trip distribution for new and pass-by trips were based on a combination of the existing peak hour turning movements traveling to/from the proposed Meridian Mall driveway at Grand River Avenue and on the MDOT AADT data obtained for Okemos Road to the west, Grand River Avenue, and Marsh Road to the east. It is expected that bank traffic will be traveling to/from these major area roadways. Due to the heavy traffic flows and periodic eastbound queues that back up through the east Meridian Mall driveway to Grand River Avenue, existing counts showed that very few cars make a left-turn onto eastbound Grand River Avenue from the Meridian Mall driveway in the PM peak hour. It is expected that new bank traffic will follow a similar pattern with most of the traffic that is traveling to the east on Grand River Avenue or turning north or south onto Marsh Road will do so via the

signalized Meridian Mall driveway to Marsh Road. The trip distributions and traffic assignments reflect that estimated traffic pattern.

Trip Distribution – New Trips

- 40% to/from the west on Grand River Avenue
- 15% to/from the east on Grand River Avenue
- 15% to/from the west on Mall Drive (toward Okemos Road)
- 30% to/from the east on Mall Drive (toward Marsh Road)

Trip Distribution – Internally Linked Trips

- 55% to/from the west on Mall Drive
- 45% to/from the east on Mall Drive

Trip Distribution – Pass-by Trips

- 41% AM & 55% PM eastbound on Grand River Avenue
- 59% AM & 45% PM westbound on Grand River Avenue

Traffic Assignment

The proposed bank trips were assigned to the study intersections and site driveways based on the above trip distributions. The traffic assignments are shown on the following Exhibits:

- Exhibit 6: Meridian Mall Bank New Trips
- Exhibit 7: Meridian Mall Bank Externally Linked Trips
- Exhibit 8: Meridian Mall Bank Pass-by Trips
- Exhibit 9: Meridian Mall Bank Driveway Trips

Build Traffic Volumes

The Meridian Mall Bank driveway trips (shown on Exhibit 9) were added to the 2021 Background traffic volumes to generate the 2021 Build traffic volumes evaluated in this study. The 2021 Build Traffic Volumes are shown on Exhibit 10.

SIGHT DISTANCE

The sight distance requirements for the Meridian Mall driveways to Grand River Avenue were reviewed for traffic making a left-turn or right-turn from these driveways. Grand River Avenue is straight and flat and the Y-shaped driveway configuration results in angles that provide greater visibility of oncoming traffic on Grand River Avenue from the driveway stop bars.

According to the American Association of State Highway and Transportation Officials (AASHTO), the sight distance requirements for a single-unit design vehicle turning onto a five-lane road with a design speed of 50 mph (assumed as five mph over the posted speed limit) is a minimum of 800 feet for a vehicle making a left turn (looking right) and a minimum of 625 feet for a vehicle making a right turn (looking left). The west Meridian Mall driveway (for exiting right turns) is located 625 feet west of Marsh Road and the east Meridian Mall driveway (for exiting left turns) is located 1,625 east of Okemos Road. Based on field observations, vehicles from the Meridian Mall driveway can see oncoming Grand

River Avenue traffic from both of these intersections. Therefore, the minimum sight distance requirements are met.

PEAK HOUR TRAFFIC OPERATIONS & QUEUES

The study intersections were analyzed using the Synchro 11 traffic analysis model (outputs based on the *Highway Capacity Manual, 6th Edition*), SimTraffic 11, and the peak hour turning movement volumes estimated for each intersection. Intersection operation is defined by “level of service.” Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS ‘A’, to very poor, represented by LOS ‘F’ (see Table 2). For the purposes of this study, LOS D or better was used to define acceptable peak hour operating conditions.

Table 2. LOS Descriptions

| LOS | Signalized Intersections Control Delay/Vehicle (sec/veh) | Unsignalized Intersections Avg. Control Delay (sec/veh) | Relative Delay |
|-----|--|---|--------------------|
| A | ≤10 | ≤10 | Short Delays |
| | Free-flow traffic operations at average travel speeds. Vehicles completely unimpeded in ability to maneuver. Minimal delay at signalized intersections | | |
| | > 10 - 20 | > 10 - 15 | |
| B | Reasonably unimpeded traffic operations at average travel speeds. Vehicle maneuverability slightly restricted. Low traffic delays. | | Short Delays |
| | > 20 - 35 | > 15 - 25 | |
| C | Stable traffic operations. Lane changes becoming more restricted. Travel speeds reduced to half of average free flow travel speeds. Longer | | Moderate Delays |
| | > 35 - 55 | > 25 - 35 | |
| D | Small increases in traffic flow can cause increased delays. Delays likely attributable to increased traffic, reduced signal progression, and adverse | | Moderate Delays |
| | > 55 - 80 | > 35 - 50 | |
| E | Significant delays. Travel speeds reduced to one-third of average free flow travel speed. | | Long Delays |
| | > 80 | > 50 | |
| F | Extremely low speeds. Intersection congestion. Long delays. Extensive traffic queues at intersections. | | Long Delays |

Source: Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010

The capacity analysis tables showing the peak hour intersection and approach delays (in seconds per vehicle) and LOS are shown in Table 3 for the AM peak hour and in Table 4 for the PM peak hour. The LOS tables compare the expected traffic operations between the 2021 Background (No Build) and 2021 Build (with buildout of the proposed bank) traffic volumes. The Synchro and SimTraffic analysis reports for the 2021 Background traffic analysis are in Appendix B. The Synchro and SimTraffic analysis reports for the 2021 Build traffic analysis are in Appendix C.

Table 3. AM Peak Hour Traffic Operations

| Intersection | Approach | AM Peak Hour | | | |
|--|----------|--------------|-----|------------|-----|
| | | 2021 Bckgd | | 2021 Build | |
| | | Delay | LOS | Delay | LOS |
| Grand River Avenue & W. Mall Driveway* <i>Traffic Signal Control</i> | EB | 0.5 | A | 0.9 | A |
| | WB | 1.4 | A | 1.4 | A |
| | SB | 2.2 | A | 2.2 | A |
| | Overall | 1.1 | A | 1.3 | A |
| Grand River Avenue & E. Mall Driveway <i>Stop Sign Control</i> | EB | 0.0 | A | 0.0 | A |
| | WB | 0.3 | A | 0.3 | A |
| | NB | 26.5 | D | 26.4 | D |
| | SB | 57.3 | F | 59.9 | F |
| | Overall | 1.5 | A | 1.6 | A |

*SimTraffic used for delay evaluation due to non-NEMA phasing/unable to process HCM 6 results.

Table 4. PM Peak Hour Traffic Operations

| Intersection | Approach | PM Peak Hour | | | |
|---|----------|--------------|-----|------------|-----|
| | | 2021 Bckgd | | 2021 Build | |
| | | Delay | LOS | Delay | LOS |
| Grand River Avenue & W. Mall Driveway <i>Traffic Signal Control</i> | EB | 1.9 | A | 2.1 | A |
| | WB | 2.4 | A | 3.0 | A |
| | SB | 2.0 | A | 1.4 | A |
| | Overall | 2.0 | A | 2.3 | A |
| Grand River Avenue & E. Mall Driveway <i>Stop Sign Control</i> | EB | 0.0 | A | 0.0 | A |
| | WB | 0.2 | A | 0.2 | A |
| | NB | 38.9 | E | 38.3 | E |
| | SB | 65.0 | F | 67.7 | F |
| | Overall | 1.4 | A | 1.5 | A |

*SimTraffic used for delay evaluation due to non-NEMA phasing/unable to process HCM 6 results.

All traffic movements at the signalized west Meridian Mall driveway to Grand River Avenue operates at acceptable LOS A for all traffic movements with the 2021 Background and 2021 Build traffic volumes. The northbound and southbound approaches at the stop-controlled east Meridian Mall driveway to Grand River Avenue operate at LOS E and F conditions with both the 2021 Background and 2021 Build traffic volumes. During the peak hours, fewer gaps in Grand River Avenue traffic exist so that vehicles from the east Meridian Mall driveway and the opposing Meijer development/Belle Tire driveway have to wait up to about one minute in order to make a left turn onto Grand River Avenue. Due to the heavy peak hour volumes on Grand River Avenue, this level of left-turn delay is typical for most of the stop-controlled driveways on Grand River Avenue in the vicinity of the Meridian Mall. Queues at the driveway approaches are expected to be low at all driveway approaches (1-2 vehicle queues in the peak hours). The bank traffic is expected to generate very little additional delay at the study intersections compared to the 2021 Background (No Build) traffic condition.

CONCLUSIONS

The proposed bank is expected to generate a relatively low amount of additional traffic during the peak hours. Because of its location on the south side of the Meridian Mall, the majority of the bank trips are expected to travel through the Meridian Mall driveways to Grand River Avenue. This additional traffic is expected to impact the study area by adding only minor peak hour delay increases (up to 2.7 seconds per vehicle) to the turning movements from the Meridian Mall driveways to Grand River Avenue. Delay increases to eastbound and westbound Grand River Avenue are expected to be negligible throughout the entire day.

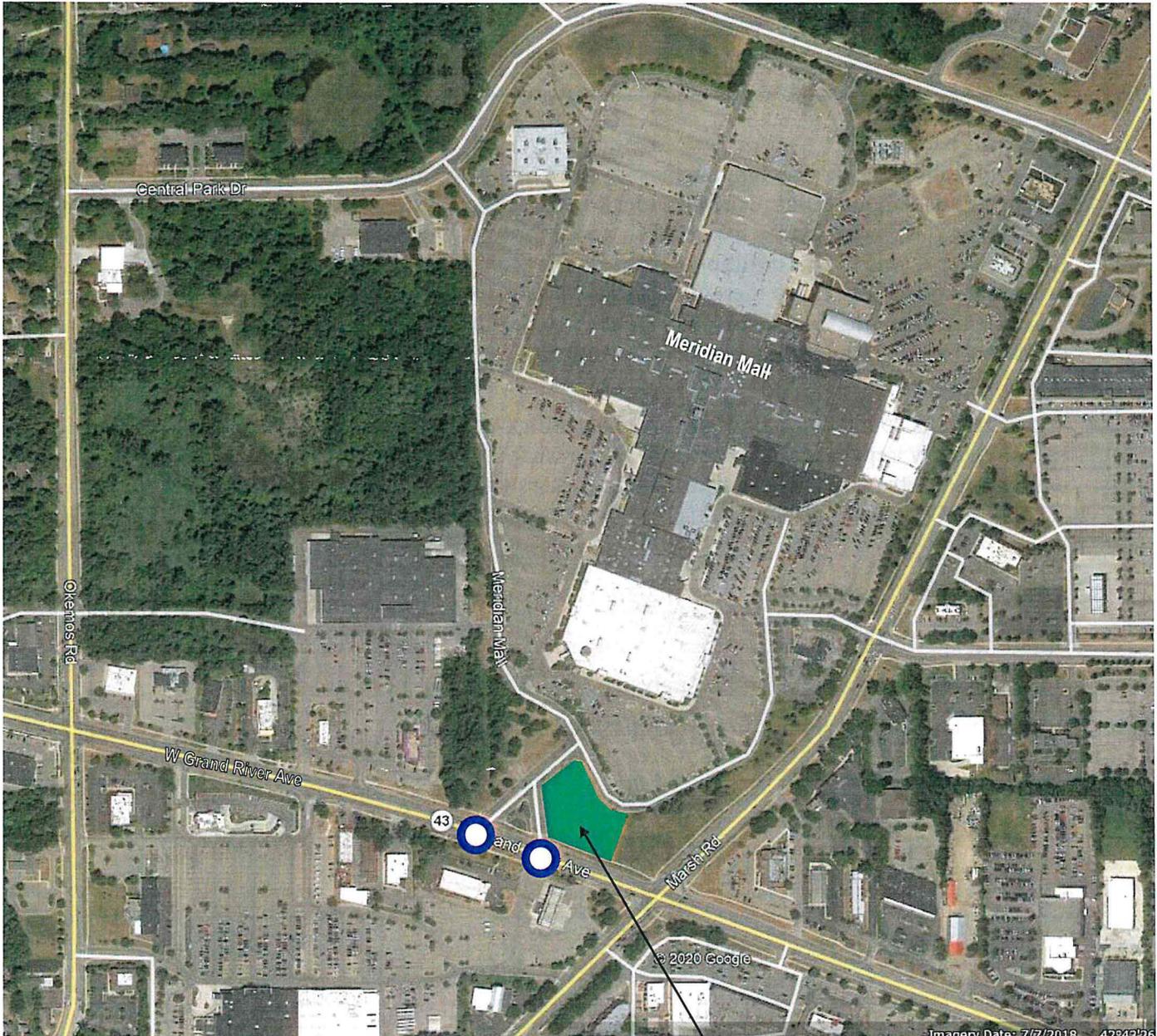
Therefore, it is concluded that the additional traffic from the proposed bank is not expected to significantly impact traffic operations at the study intersections. No changes to the existing geometrics or traffic control at these intersections are recommended to accommodate the additional traffic from the proposed bank.

APPENDICES

Appendix A – Traffic Counts

Appendix B – Synchro/SimTraffic Analysis: 2021 Background Traffic

Appendix C – Synchro/SimTraffic Analysis: 2021 Build Traffic



Imagery Date: 7/7/2018 47°45'26"
Source: GoogleEarth, accessed 10-9-2020

Proposed Bank Location

LEGEND

-  Study Area Intersection
-  Site Location

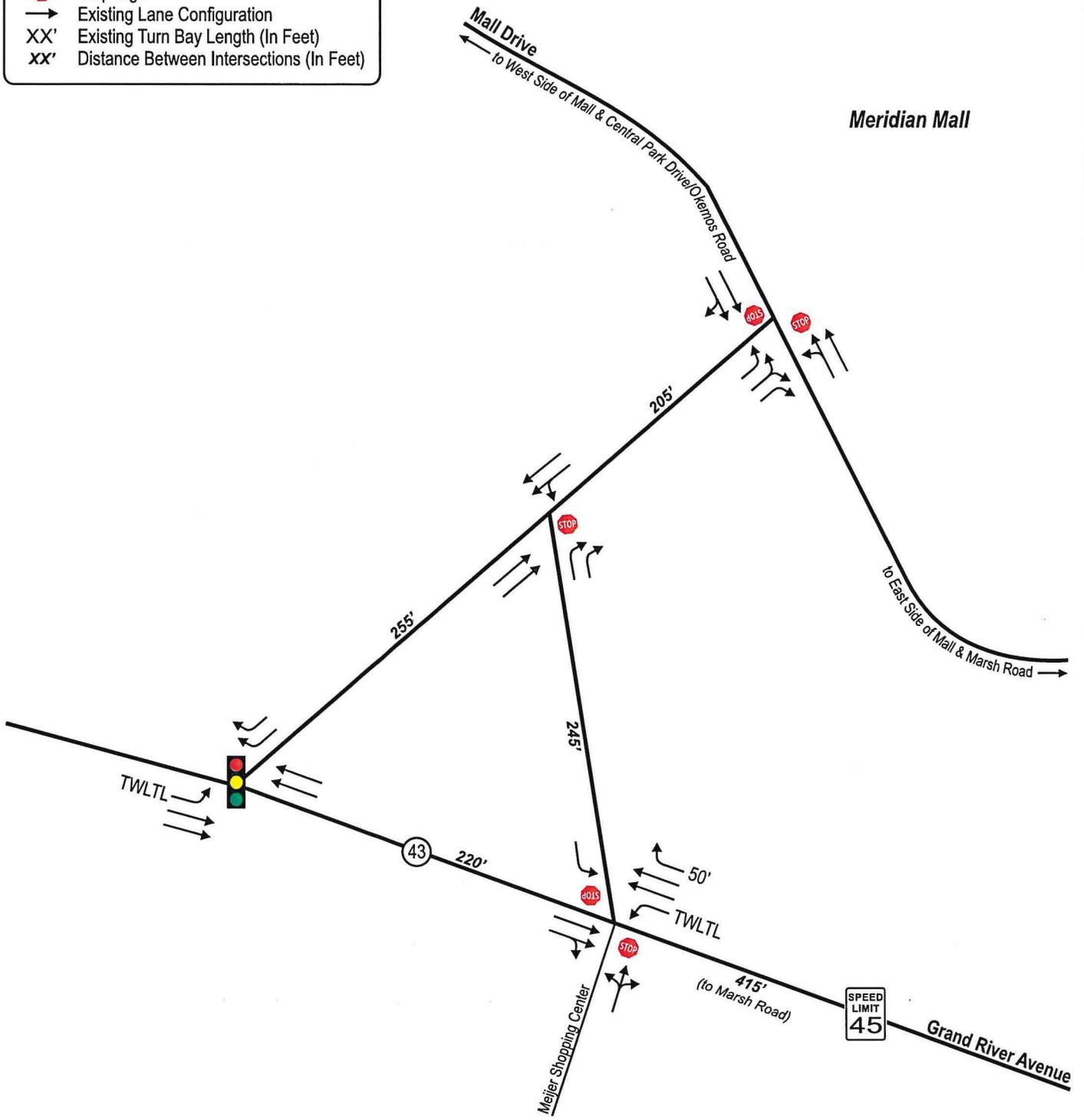


**EXHIBIT 1
SITE LOCATION MAP**

MERIDIAN MALL BANK TIA - OKEMOS, MICHIGAN

LEGEND

-  Traffic Signal
-  Stop Sign
-  Existing Lane Configuration
- XX' Existing Turn Bay Length (In Feet)
- XX' Distance Between Intersections (In Feet)



Meridian Mall

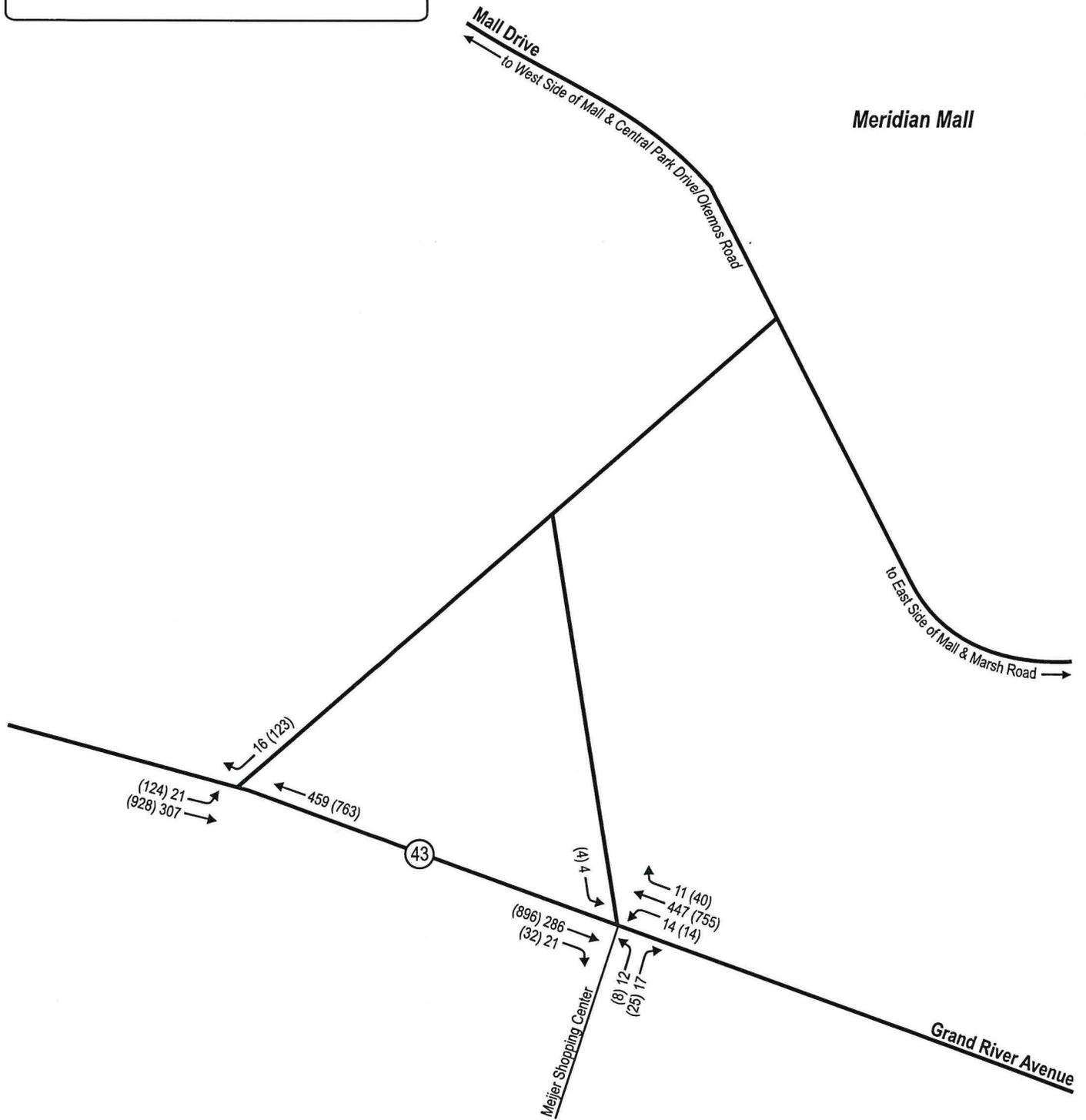


**EXHIBIT 2
EXISTING TRANSPORTATION SYSTEM**

MERIDIAN MALL BANK TIA - OKEMOS, MICHIGAN

LEGEND

- XX AM Peak Hour Volumes (8:00-9:00 AM)
- (XX) PM Peak Hour Volumes (5:00-6:00 PM)



Meridian Mall

**EXHIBIT 3
EXISTING TRAFFIC COUNT DATA
UNFACTORED COUNTS COLLECTED IN SEPTEMBER 2020**

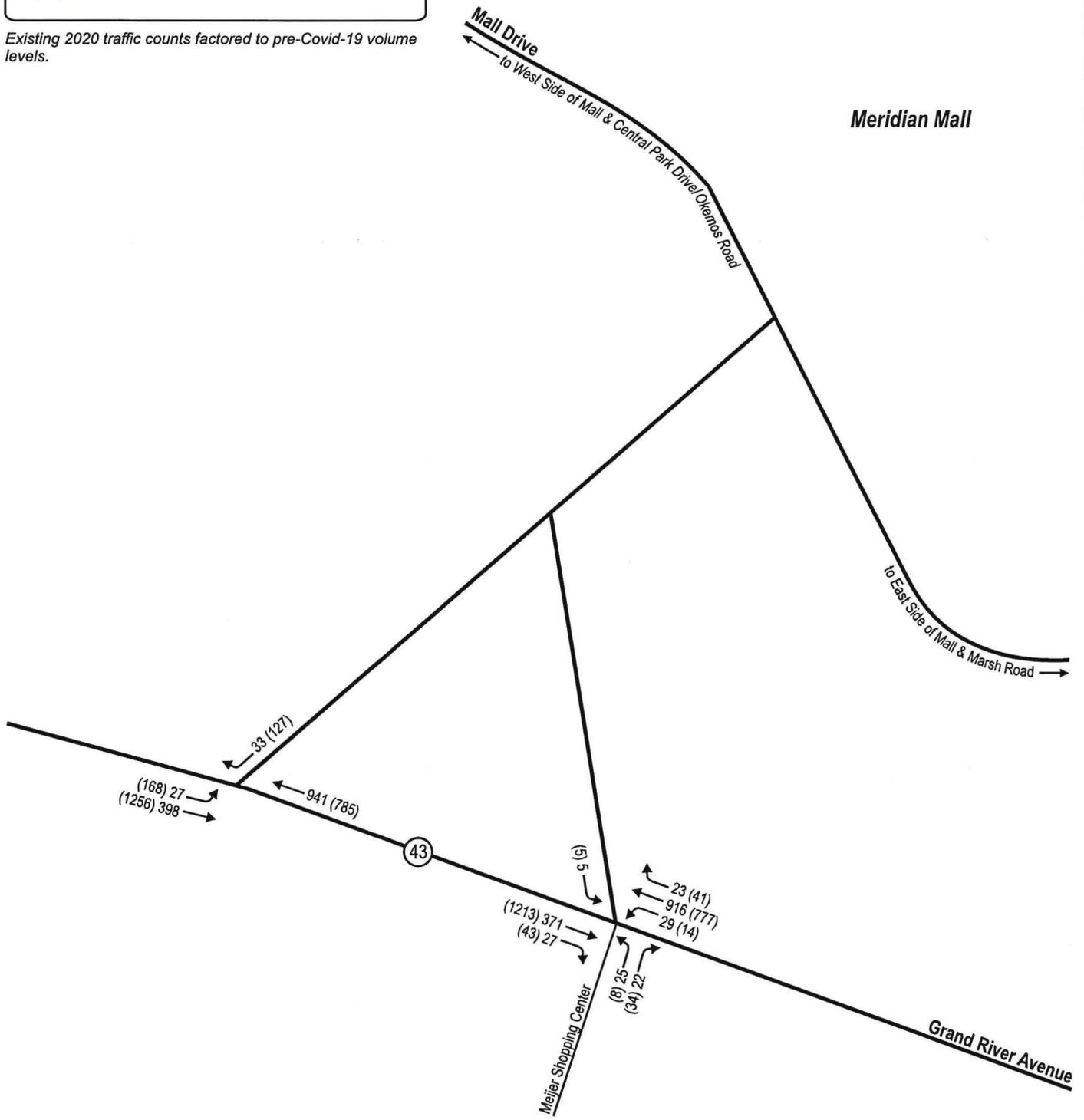
MERIDIAN MALL BANK TIA - OKEMOS, MICHIGAN



LEGEND

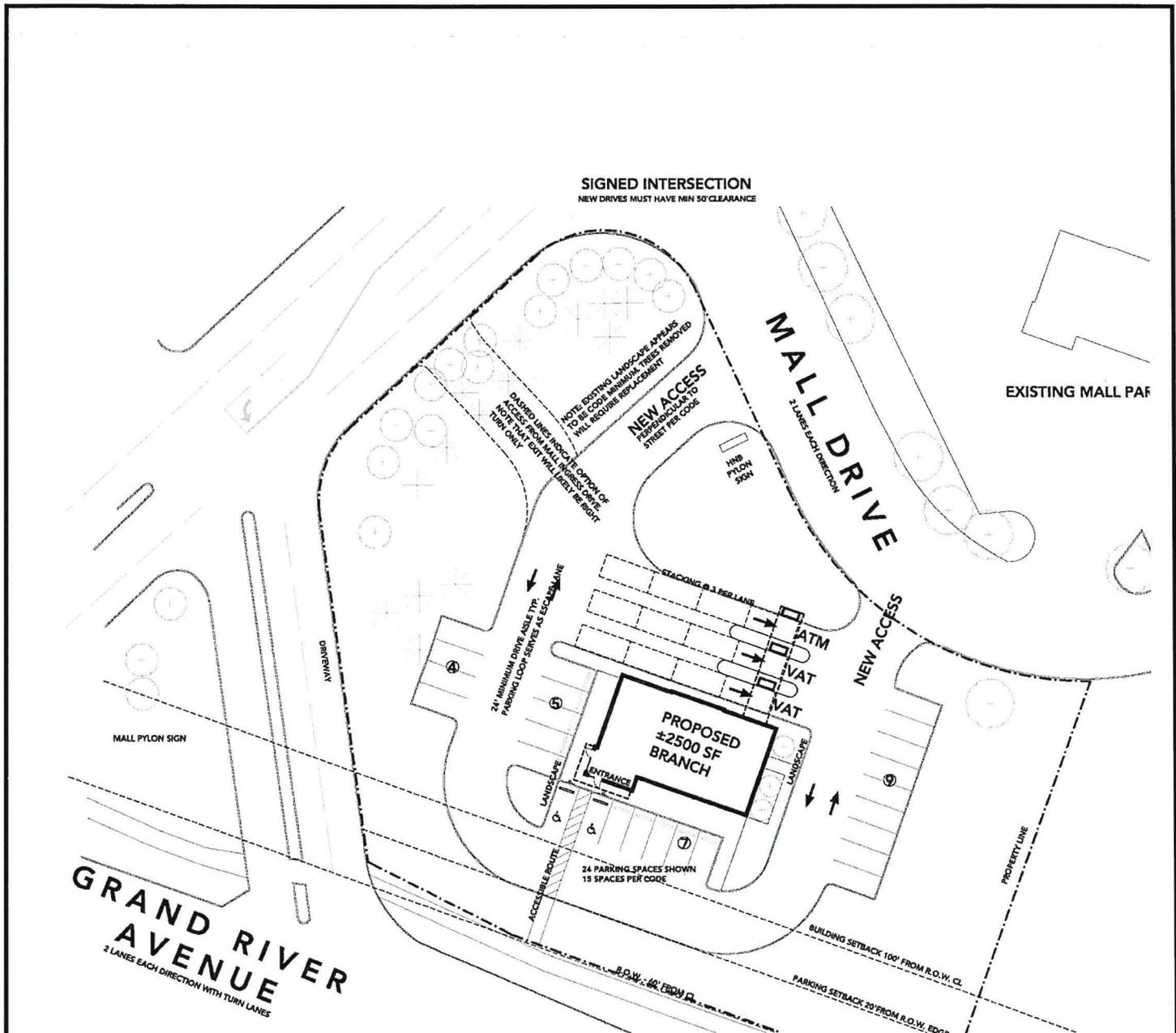
- XX AM Peak Hour Volumes (8:00-9:00 AM)
- (XX) PM Peak Hour Volumes (5:00-6:00 PM)

Existing 2020 traffic counts factored to pre-Covid-19 volume levels.



**EXHIBIT 4
2021 BACKGROUND TRAFFIC VOLUMES
FACTORED TRAFFIC COUNTS**

MERIDIAN MALL BANK TIA - OKEMOS, MICHIGAN



HUNTINGTON NATIONAL BANK | MERIDIAN MALL, MI

SCHEMATIC SITE PLAN
NTS

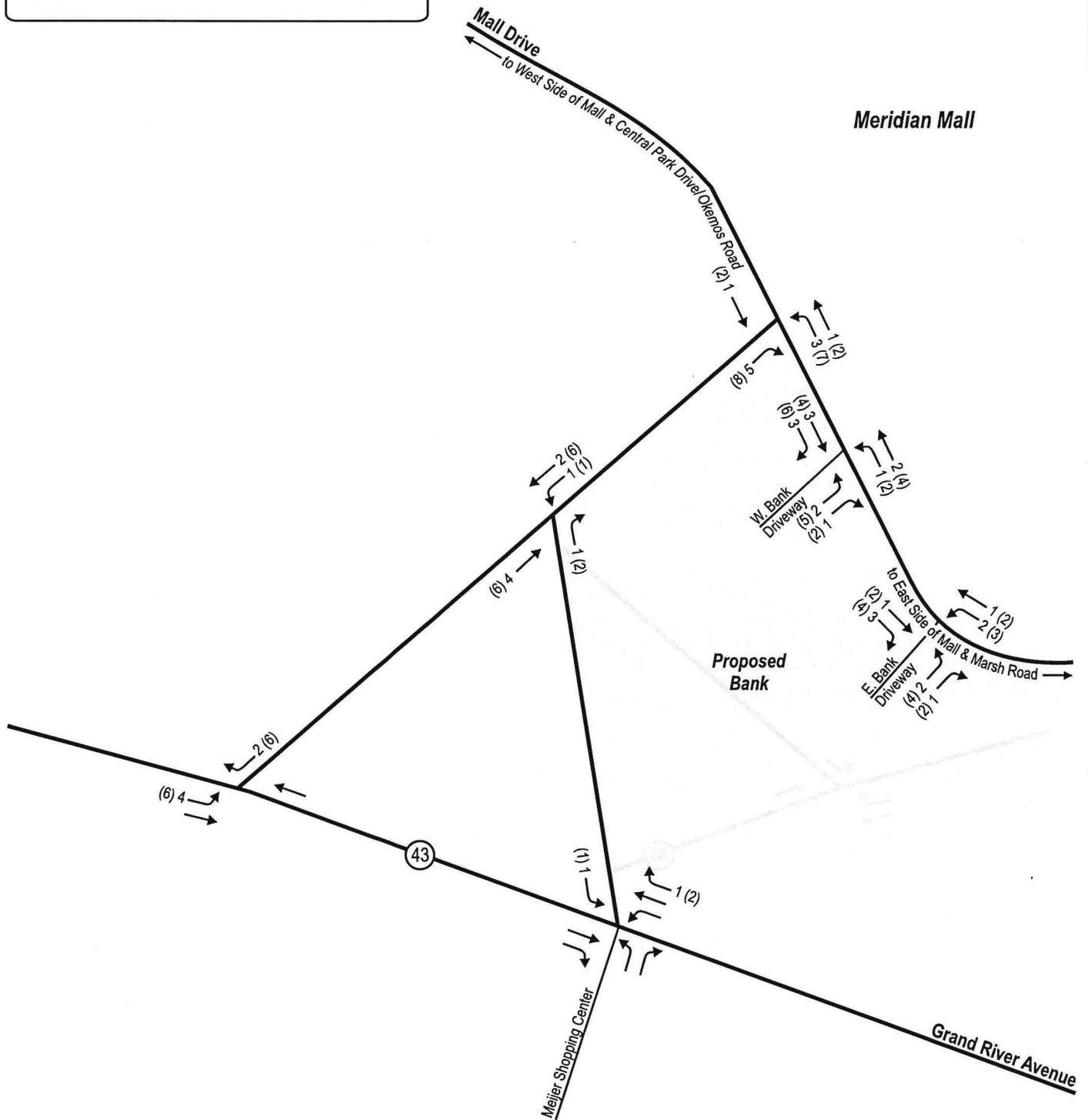


EXHIBIT 5
CONCEPTUAL SITE PLAN

MERIDIAN MALL BANK TIA - OKEMOS, MICHIGAN

LEGEND

- XX AM Peak Hour Volumes (8:00-9:00 AM)
- (XX) PM Peak Hour Volumes (5:00-6:00 PM)



Meridian Mall

Proposed Bank



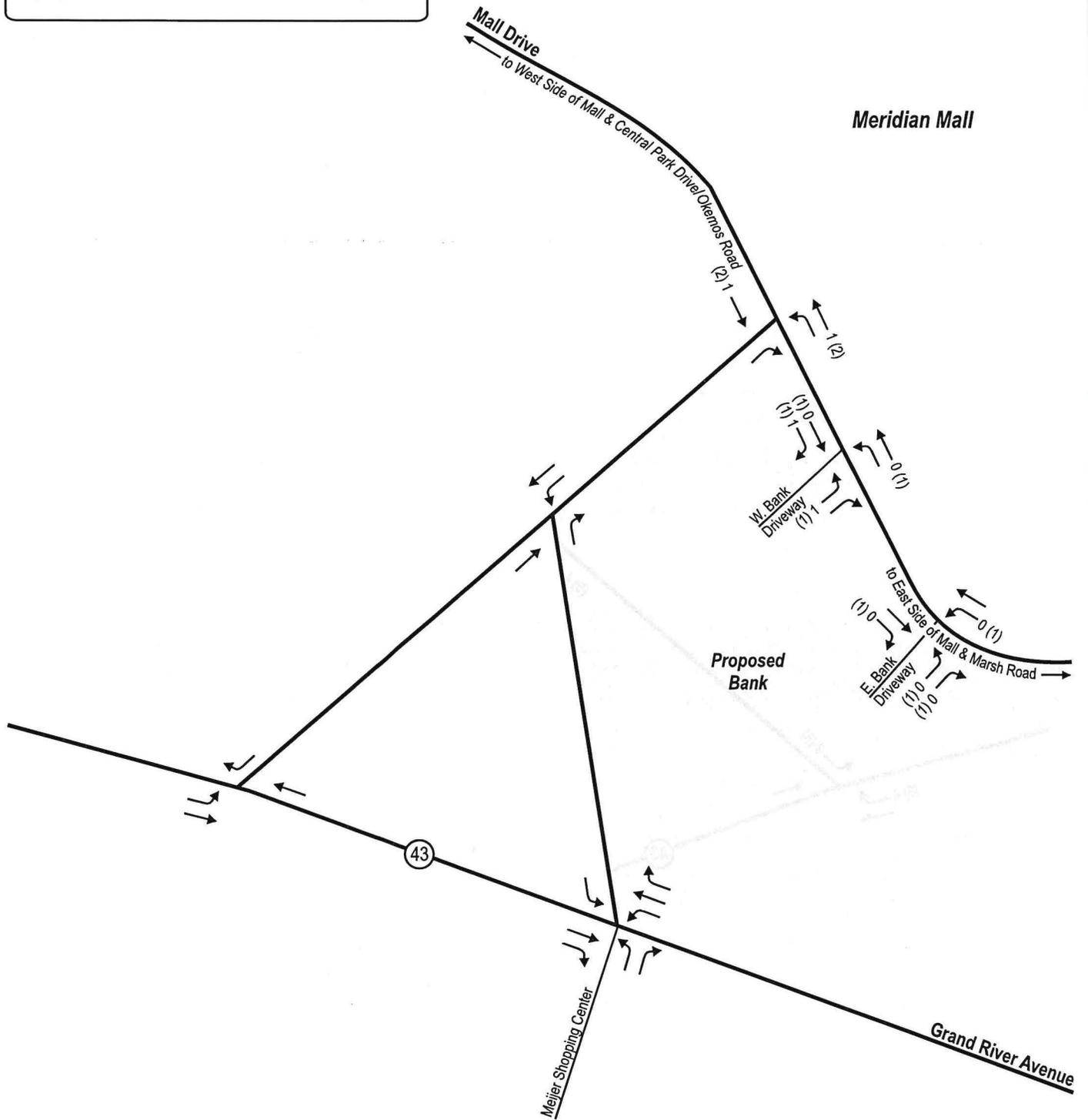
NOT TO SCALE

**EXHIBIT 6
MERIDIAN MALL BANK NEW TRIPS**

MERIDIAN MALL BANK TIA - OKEMOS, MICHIGAN

LEGEND

- XX AM Peak Hour Volumes (8:00-9:00 AM)
- (XX) PM Peak Hour Volumes (5:00-6:00 PM)



Meridian Mall

Proposed Bank

43

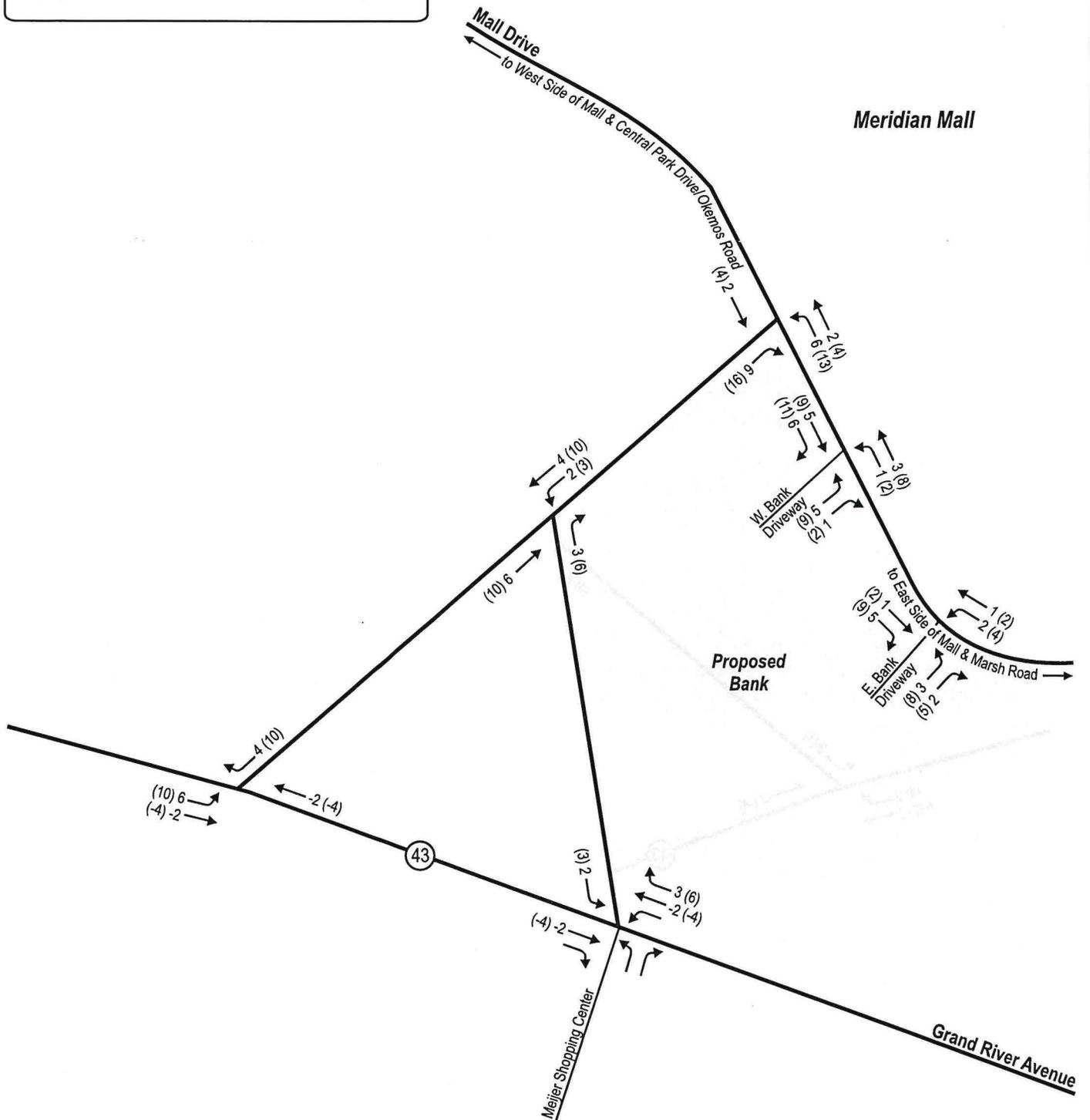


**EXHIBIT 7
MERIDIAN MALL BANK EXTERNALLY LINKED TRIPS**

MERIDIAN MALL BANK TIA - OKEMOS, MICHIGAN

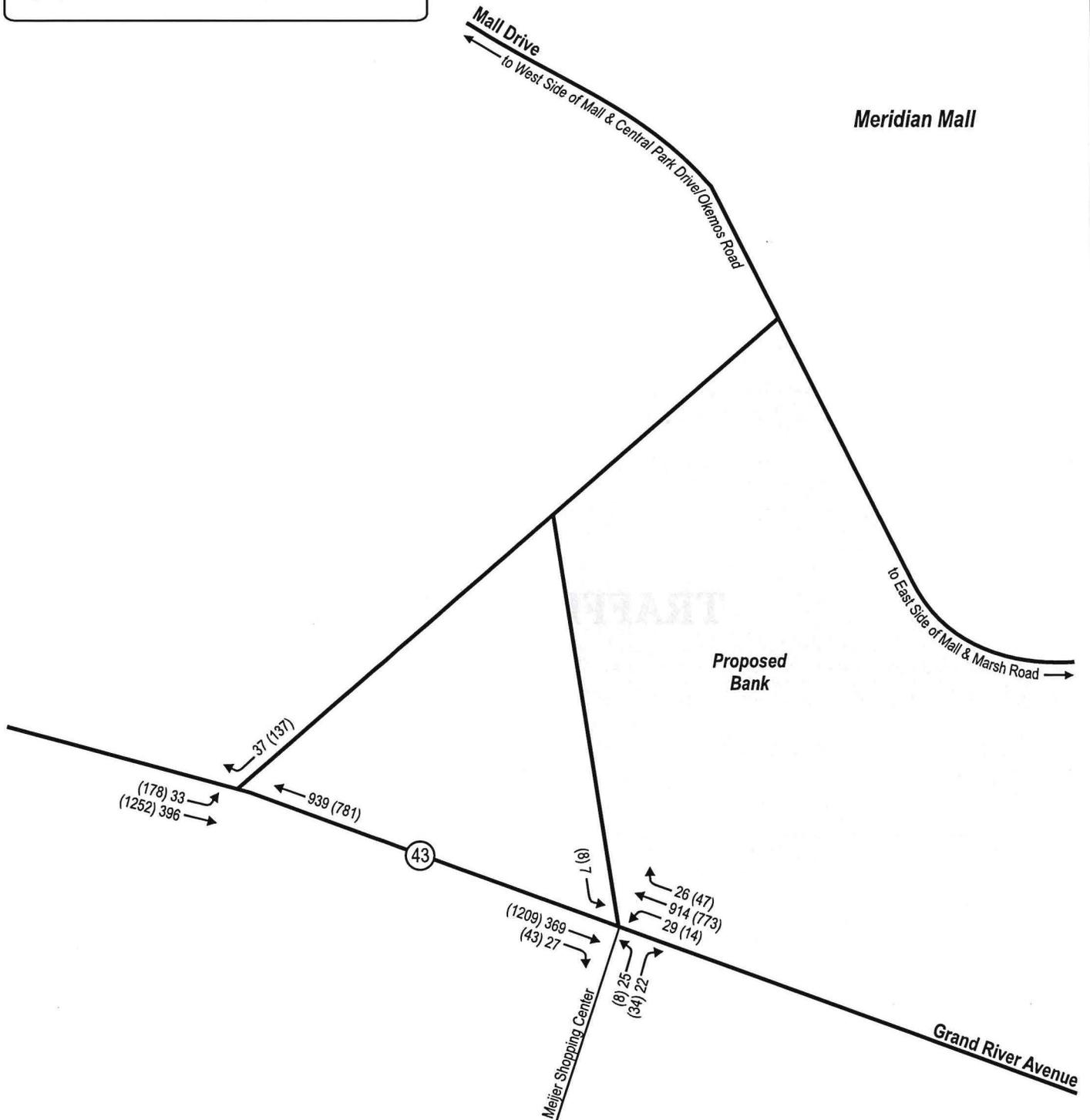
LEGEND

- XX AM Peak Hour Volumes (8:00-9:00 AM)
- (XX) PM Peak Hour Volumes (5:00-6:00 PM)



LEGEND

- XX AM Peak Hour Volumes (8:00-9:00 AM)
- (XX) PM Peak Hour Volumes (5:00-6:00 PM)



APPENDIX A

TRAFFIC COUNTS



Intersection Traffic Volume Report

Base Information, Observed (4) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **Meridian Mall Drive and Grand River Avenue**

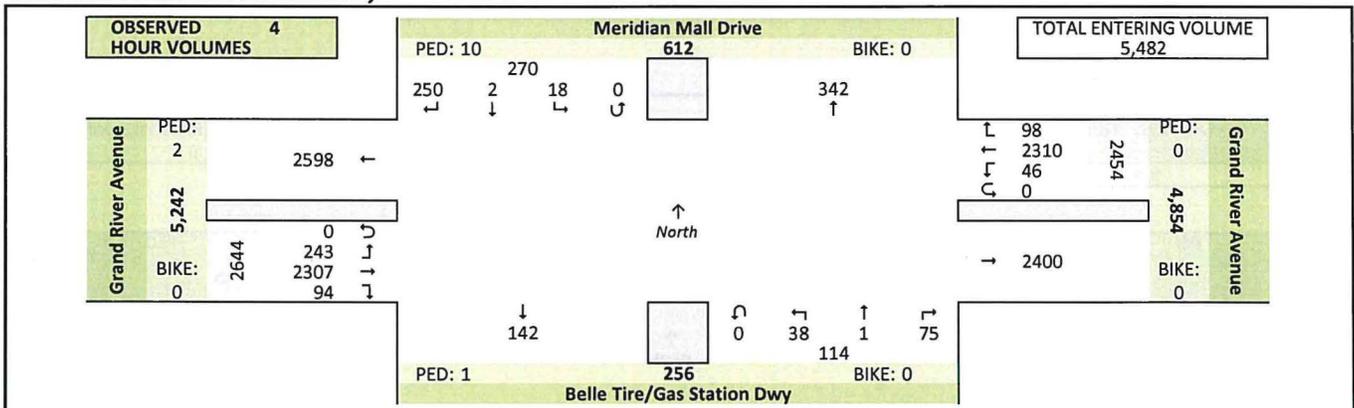
Site Information

| | | | |
|------------------------------|---|------|--|
| Municipality | Meridian Township | | |
| Traffic Control | Traffic Signal | | |
| Roadway Names | North Direction | ↑ | |
| North Leg | Meridian Mall Drive | | |
| East Leg | Grand River Avenue | | |
| South Leg | Belle Tire/Gas Station Dwy | | |
| West Leg | Grand River Avenue | | |
| Special Considerations | None | | |
| Schools | In Session | | |
| Holidays | None | | |
| Special Events | None | | |
| Special Pedestrians Observed | None | | |
| | Pre-school children | None | |
| | Elementary school age children | None | |
| | Visually impaired (white cane/helper dog) | None | |
| | Elderly/disabled (except wheelchairs) | None | |
| | Wheelchairs/electric scooters | None | |
| Other (describe) | None | None | |

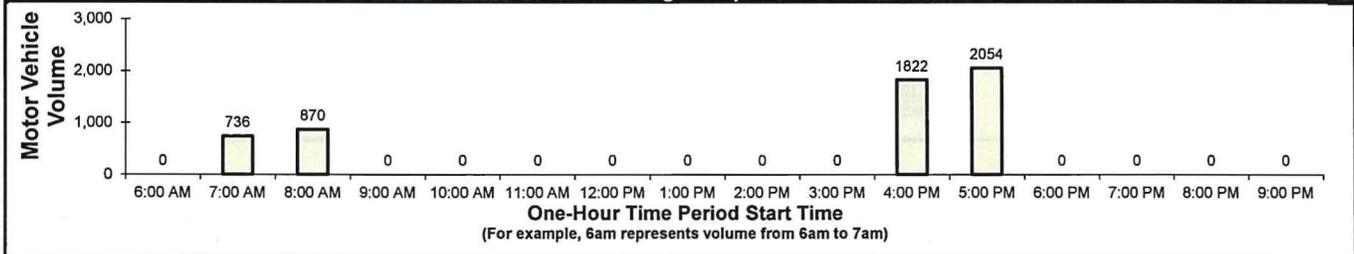
Count Information

| | | | |
|----------------------------------|--|------------------------|------------------------|
| Hrs Counted: | 7:00 AM-9:00 AM and 4:00 PM-6:00 PM | | |
| 1st Day of Count | Thursday, October 1, 2020 | | Weather |
| AM Peak Period | Thursday, October 1, 2020 | | Clear, occasional rain |
| Midday Peak Period | None | | |
| PM Peak Period | Thursday, October 1, 2020 | | Clear, occasional rain |
| Calculated Peak Hours | None | | |
| | AM | 8:00-9:00am | MD |
| Peak Hours Selected for Analysis | AM | 8:00-9:00am | MD |
| | PM | 5:00-6:00pm | |
| Daily/Seasonal Adjustment Group | None | | |
| Count Expansion Group | None | | |
| Daily/Seasonal Adjustment Factor | 1 | Count Expansion Factor | 1.000 |
| Company Name | TADI, Inc. | | Manual Adj. |
| | | | 1.000 |
| Observers | AM Peak Period | TSC | |
| | Midday Peak Period | None | |
| | PM Peak Period | TSC | |
| Comments | Okemos Public Schools and MSU operating virtually rather than in person. | | |

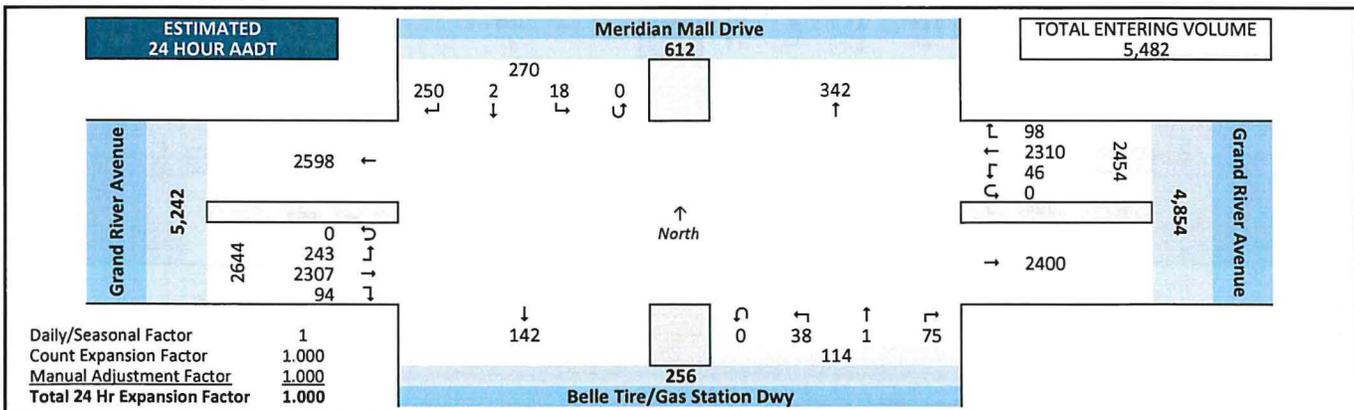
Observed 4 Hour Volume Summary



Total Entering Hourly Volume



Estimated 24 Hour AADT



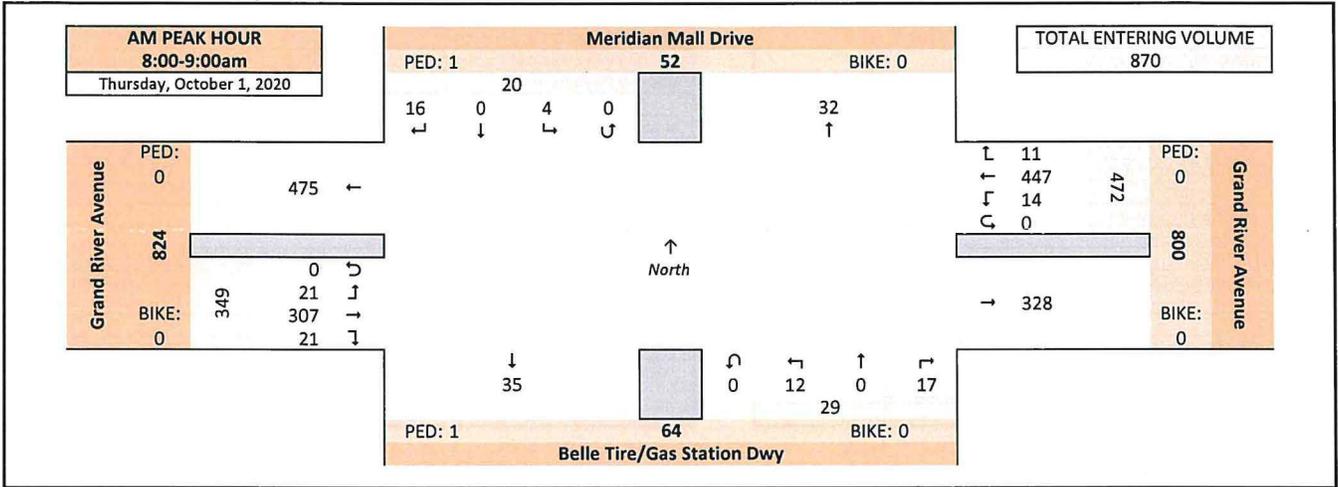
Intersection Traffic Volume Report

Peak Hour Volume Graphical Summary

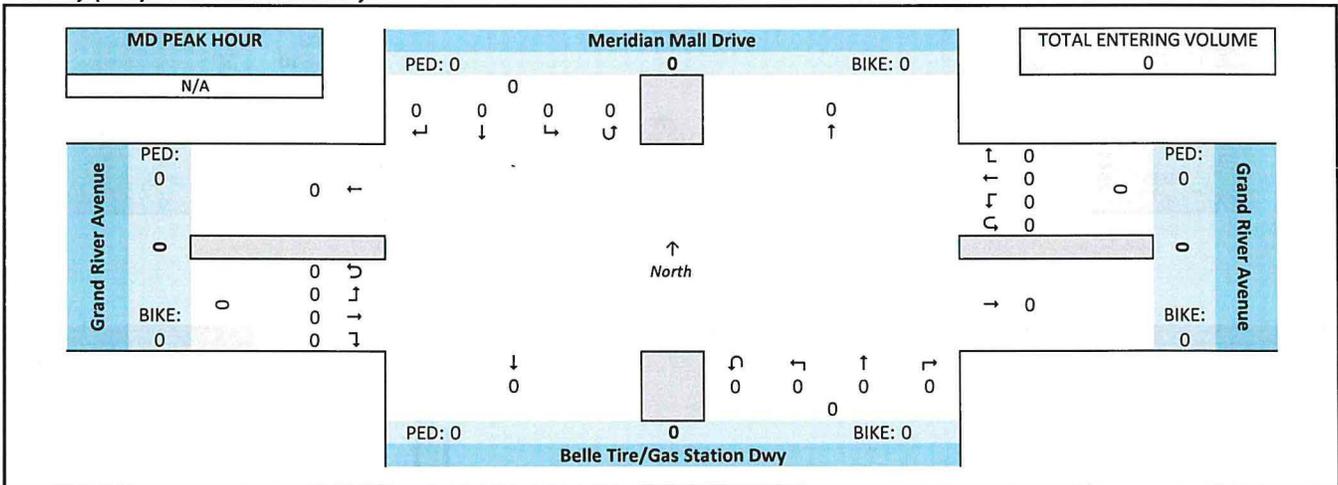
Meridian Mall Drive and Grand River Avenue



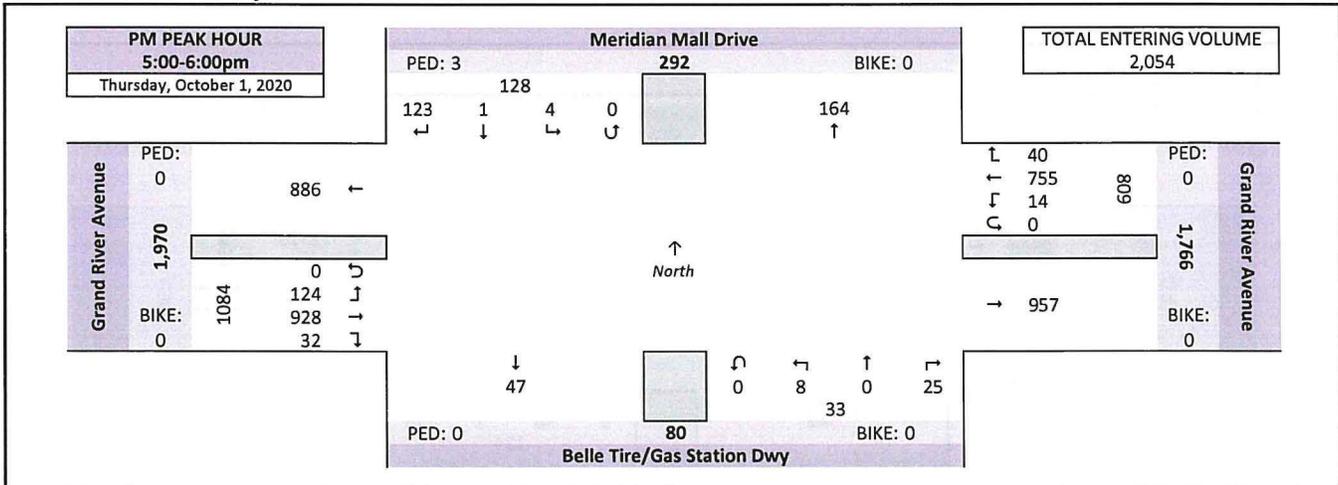
AM Peak Hour Summary



Midday (MD) Peak Hour Summary



PM Peak Hour Summary



Intersection Traffic Volume Report

15-Minute Motor Vehicle Data

Meridian Mall Drive and Grand River Avenue



15-Minute Motor Vehicle Data

| 15-Minute Time Period | From North | | | | | From East | | | | | From South | | | | | From West | | | | | 15-Min Totals | Hourly Sum | PHF | |
|-----------------------|---------------------|------|------|------|-------|--------------------|------|------|------|-------|----------------------------|------|------|------|-------|--------------------|------|------|------|-------|---------------|------------|------|--|
| | Meridian Mall Drive | | | | | Grand River Avenue | | | | | Belle Tire/Gas Station Dwy | | | | | Grand River Avenue | | | | | | | | |
| | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | | | | |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:00 AM | 2 | 1 | 0 | 0 | 3 | 2 | 68 | 1 | 0 | 71 | 1 | 1 | 2 | 0 | 4 | 3 | 36 | 3 | 0 | 42 | 120 | 736 | 0.77 | |
| 7:15 AM | 7 | 0 | 0 | 0 | 7 | 4 | 83 | 1 | 0 | 88 | 3 | 0 | 2 | 0 | 5 | 4 | 54 | 2 | 0 | 60 | 160 | 821 | 0.86 | |
| 7:30 AM | 4 | 0 | 1 | 0 | 5 | 4 | 123 | 4 | 0 | 131 | 1 | 0 | 3 | 0 | 4 | 6 | 70 | 1 | 0 | 77 | 217 | 864 | 0.90 | |
| 7:45 AM | 3 | 0 | 1 | 0 | 4 | 2 | 127 | 0 | 0 | 129 | 5 | 0 | 3 | 0 | 8 | 6 | 83 | 9 | 0 | 98 | 239 | 846 | 0.88 | |
| 8:00 AM | 3 | 0 | 1 | 0 | 4 | 4 | 111 | 3 | 0 | 118 | 3 | 0 | 2 | 0 | 5 | 5 | 69 | 4 | 0 | 78 | 205 | 870 | 0.83 | |
| 8:15 AM | 2 | 0 | 1 | 0 | 3 | 2 | 111 | 2 | 0 | 115 | 4 | 0 | 3 | 0 | 7 | 4 | 71 | 3 | 0 | 78 | 203 | | | |
| 8:30 AM | 8 | 0 | 1 | 0 | 9 | 1 | 108 | 4 | 0 | 113 | 5 | 0 | 2 | 0 | 7 | 4 | 61 | 5 | 0 | 70 | 199 | | | |
| 8:45 AM | 3 | 0 | 1 | 0 | 4 | 4 | 117 | 5 | 0 | 126 | 5 | 0 | 5 | 0 | 10 | 8 | 106 | 9 | 0 | 123 | 263 | | | |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 9:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 9:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 9:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 10:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 10:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 3:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 3:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 4:00 PM | 34 | 0 | 0 | 0 | 34 | 7 | 174 | 3 | 0 | 184 | 6 | 0 | 3 | 0 | 9 | 4 | 210 | 16 | 0 | 230 | 457 | 1822 | 0.95 | |
| 4:15 PM | 19 | 0 | 3 | 0 | 22 | 8 | 176 | 1 | 0 | 185 | 4 | 0 | 2 | 0 | 6 | 6 | 219 | 20 | 0 | 245 | 458 | 1856 | 0.95 | |
| 4:30 PM | 21 | 0 | 3 | 0 | 24 | 10 | 198 | 6 | 0 | 214 | 7 | 0 | 2 | 0 | 9 | 7 | 203 | 23 | 0 | 233 | 480 | 1938 | 0.90 | |
| 4:45 PM | 21 | 0 | 2 | 0 | 23 | 10 | 159 | 2 | 0 | 171 | 6 | 0 | 1 | 0 | 7 | 5 | 197 | 24 | 0 | 226 | 427 | 1973 | 0.91 | |
| 5:00 PM | 30 | 1 | 1 | 0 | 32 | 7 | 170 | 8 | 0 | 185 | 4 | 0 | 1 | 0 | 5 | 7 | 231 | 31 | 0 | 269 | 491 | 2054 | 0.95 | |
| 5:15 PM | 24 | 0 | 0 | 0 | 24 | 11 | 200 | 0 | 0 | 211 | 8 | 0 | 5 | 0 | 13 | 9 | 249 | 34 | 0 | 292 | 540 | | | |
| 5:30 PM | 31 | 0 | 2 | 0 | 33 | 7 | 189 | 2 | 0 | 198 | 5 | 0 | 0 | 0 | 5 | 11 | 238 | 30 | 0 | 279 | 515 | | | |
| 5:45 PM | 38 | 0 | 1 | 0 | 39 | 15 | 196 | 4 | 0 | 215 | 8 | 0 | 2 | 0 | 10 | 5 | 210 | 29 | 0 | 244 | 508 | | | |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 9:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 9:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 9:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 9:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Totals | 250 | 2 | 18 | 0 | 270 | 98 | 2310 | 46 | 0 | 2454 | 75 | 1 | 38 | 0 | 114 | 94 | 2307 | 243 | 0 | 2644 | 5482 | | | |

Peak Hour All Vehicle Volume Summary

| Hourly Time Period | From North | | | | | From East | | | | | From South | | | | | From West | | | | | Total Hourly Volume | PHF |
|--------------------|---------------------|------|------|------|-------|--------------------|------|------|------|-------|----------------------------|------|------|------|-------|--------------------|------|------|------|-------|---------------------|------|
| | Meridian Mall Drive | | | | | Grand River Avenue | | | | | Belle Tire/Gas Station Dwy | | | | | Grand River Avenue | | | | | | |
| | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | | |
| AM 8:00 AM | 16 | 0 | 4 | 0 | 20 | 11 | 447 | 14 | 0 | 472 | 17 | 0 | 12 | 0 | 29 | 21 | 307 | 21 | 0 | 349 | 870 | 0.83 |
| MD 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| PM 5:00 PM | 123 | 1 | 4 | 0 | 128 | 40 | 755 | 14 | 0 | 809 | 25 | 0 | 8 | 0 | 33 | 32 | 928 | 124 | 0 | 1084 | 2054 | 0.95 |

Intersection Traffic Volume Report

| | | | |
|--------------------------------|---------------------------|-------------|---------------------|
| Count Basics | | | Page 9 of 13 |
| Start Date: | Thursday, October 1, 2020 | Weekday | Schools in Session |
| Total Number of Hours Counted: | 4 | Non-Holiday | No Special Events |

15-Minute Heavy Vehicle Data

Meridian Mall Drive and Grand River Avenue

Heavy Vehicles (Single-Unit Trucks, Buses & Semi-Trucks)



15-Minute Heavy Vehicle Data

| 15-Minute Time Period | From North | | | | | From East | | | | | From South | | | | | From West | | | | | 15-Min Totals | Hourly Sum | |
|-----------------------|---------------------|----------|----------|----------|-----------|--------------------|-----------|----------|----------|-----------|----------------------------|----------|----------|----------|----------|--------------------|-----------|----------|----------|-----------|---------------|------------|---|
| | Meridian Mall Drive | | | | | Grand River Avenue | | | | | Belle Tire/Gas Station Dwy | | | | | Grand River Avenue | | | | | | | |
| | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | | | |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00 AM | 1 | 1 | 0 | 0 | 2 | 2 | 3 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 4 | 13 | 38 | |
| 7:15 AM | 2 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 6 | 40 | |
| 7:30 AM | 2 | 0 | 0 | 0 | 2 | 2 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 12 | 51 | |
| 7:45 AM | 3 | 0 | 0 | 0 | 3 | 2 | 1 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 7 | 53 | |
| 8:00 AM | 2 | 0 | 1 | 0 | 3 | 2 | 4 | 1 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 4 | 15 | 57 | |
| 8:15 AM | 1 | 0 | 0 | 0 | 1 | 2 | 7 | 1 | 0 | 10 | 2 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 0 | 4 | 17 | | |
| 8:30 AM | 3 | 0 | 1 | 0 | 4 | 1 | 4 | 1 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 3 | 14 | | |
| 8:45 AM | 1 | 0 | 0 | 0 | 1 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 3 | 11 | | |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 10:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 10:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 4:00 PM | 3 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 10 | 45 | |
| 4:15 PM | 2 | 0 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 10 | 42 | |
| 4:30 PM | 2 | 0 | 0 | 0 | 2 | 3 | 5 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 14 | 41 | |
| 4:45 PM | 2 | 0 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 11 | 33 | |
| 5:00 PM | 3 | 0 | 0 | 0 | 3 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 7 | 33 | |
| 5:15 PM | 2 | 0 | 0 | 0 | 2 | 3 | 1 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 9 | | |
| 5:30 PM | 2 | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | | |
| 5:45 PM | 3 | 0 | 0 | 0 | 3 | 3 | 3 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 11 | | |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Totals | 34 | 1 | 2 | 0 | 37 | 32 | 47 | 3 | 0 | 82 | 6 | 1 | 2 | 0 | 9 | 2 | 42 | 1 | 0 | 45 | 173 | | |

Peak Hour Heavy Vehicle Volume Summary

| Hourly Time Period | From North | | | | | From East | | | | | From South | | | | | From West | | | | | Total Hourly Volume |
|--------------------|---------------------|------|------|------|-------|--------------------|------|------|------|-------|----------------------------|------|------|------|-------|--------------------|------|------|------|-------|---------------------|
| | Meridian Mall Drive | | | | | Grand River Avenue | | | | | Belle Tire/Gas Station Dwy | | | | | Grand River Avenue | | | | | |
| | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | Right | Thru | Left | U-Tn | Total | |
| AM 8:00 AM | 7 | 0 | 2 | 0 | 9 | 7 | 19 | 3 | 0 | 29 | 3 | 0 | 2 | 0 | 5 | 1 | 12 | 1 | 0 | 14 | 57 |
| MD 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PM 5:00 PM | 10 | 0 | 0 | 0 | 10 | 9 | 8 | 0 | 0 | 17 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 5 | 33 |

APPENDIX B

SYNCHRO/SIMTRAFFIC ANALYSIS

2021 Background Traffic

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 1.5 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑↑ | | ↑ | ↑↑ | ↑ | | ↕ | | ↑ | | |
| Traffic Vol, veh/h | 0 | 371 | 27 | 29 | 916 | 23 | 25 | 0 | 22 | 5 | 0 | 0 |
| Future Vol, veh/h | 0 | 371 | 27 | 29 | 916 | 23 | 25 | 0 | 22 | 5 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - | 350 | - | 50 | - | - | - | 0 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 71 | 71 | 71 | 94 | 94 | 94 | 72 | 72 | 72 | 60 | 60 | 60 |
| Heavy Vehicles, % | 4 | 4 | 4 | 6 | 6 | 6 | 17 | 17 | 17 | 45 | 45 | 45 |
| Mvmt Flow | 0 | 523 | 38 | 31 | 974 | 24 | 35 | 0 | 31 | 8 | 0 | 0 |

| Major/Minor | Major1 | Major2 | Minor1 | Minor2 | | | | | | | | |
|----------------------|--------|--------|--------|--------|---|---|------|------|------|------|---|---|
| Conflicting Flow All | - | 0 | 0 | 561 | 0 | 0 | 1091 | 1602 | 281 | 1298 | - | - |
| Stage 1 | - | - | - | - | - | - | 542 | 542 | - | 1036 | - | - |
| Stage 2 | - | - | - | - | - | - | 549 | 1060 | - | 262 | - | - |
| Critical Hdwy | - | - | - | 4.22 | - | - | 7.84 | 6.84 | 7.24 | 8.4 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.84 | 5.84 | - | 7.4 | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.84 | 5.84 | - | 7.4 | - | - |
| Follow-up Hdwy | - | - | - | 2.26 | - | - | 3.67 | 4.17 | 3.47 | 3.95 | - | - |
| Pot Cap-1 Maneuver | 0 | - | - | 979 | - | - | 151 | 90 | 673 | 83 | 0 | 0 |
| Stage 1 | 0 | - | - | - | - | - | 456 | 483 | - | 181 | 0 | 0 |
| Stage 2 | 0 | - | - | - | - | - | 451 | 269 | - | 612 | 0 | 0 |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | - | 979 | - | - | 147 | 87 | 673 | 77 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 147 | 87 | - | 77 | - | - |
| Stage 1 | - | - | - | - | - | - | 456 | 483 | - | 181 | - | - |
| Stage 2 | - | - | - | - | - | - | 437 | 260 | - | 584 | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-----|------|------|
| HCM Control Delay, s | 0 | 0.3 | 26.5 | 57.3 |
| HCM LOS | | | D | F |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h) | 232 | - | - | 979 | - | - | 77 |
| HCM Lane V/C Ratio | 0.281 | - | - | 0.032 | - | - | 0.108 |
| HCM Control Delay (s) | 26.5 | - | - | 8.8 | - | - | 57.3 |
| HCM Lane LOS | D | - | - | A | - | - | F |
| HCM 95th %tile Q(veh) | 1.1 | - | - | 0.1 | - | - | 0.3 |

200: Grand River Avenue & W. Mall Driveway Performance by approach

| Approach | EB | WB | SB | All |
|--------------------|-----|-----|-----|-----|
| Denied Del/Veh (s) | 0.3 | 0.0 | 0.0 | 0.1 |
| Total Del/Veh (s) | 0.5 | 1.4 | 2.2 | 1.1 |

Intersection: 200: Grand River Avenue & W. Mall Driveway

| Movement | EB | WB | WB | SB | SB |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served | L | T | T | R | R |
| Maximum Queue (ft) | 27 | 112 | 53 | 59 | 43 |
| Average Queue (ft) | 9 | 43 | 20 | 10 | 2 |
| 95th Queue (ft) | 29 | 99 | 50 | 39 | 15 |
| Link Distance (ft) | | 106 | 106 | 123 | 123 |
| Upstream Blk Time (%) | | 0 | | | |
| Queuing Penalty (veh) | | 2 | | | |
| Storage Bay Dist (ft) | 500 | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 1.4 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑↑ | | ↑ | ↑↑ | ↑ | | ↔ | | ↑ | | |
| Traffic Vol, veh/h | 0 | 1213 | 43 | 14 | 777 | 41 | 8 | 0 | 34 | 5 | 1 | 0 |
| Future Vol, veh/h | 0 | 1213 | 43 | 14 | 777 | 41 | 8 | 0 | 34 | 5 | 1 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - | 350 | - | 50 | - | - | - | 0 | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 94 | 94 | 94 | 63 | 63 | 63 | 82 | 82 | 82 |
| Heavy Vehicles, % | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 8 | 8 | 8 |
| Mvmt Flow | 0 | 1304 | 46 | 15 | 827 | 44 | 13 | 0 | 54 | 6 | 1 | 0 |

| Major/Minor | Major1 | Major2 | Minor1 | Minor2 |
|----------------------|--------|--------|--------|--------|
| Conflicting Flow All | - | 0 | 0 | 1350 |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |
| Critical Hdwy | - | - | 4.14 | - |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - |
| Follow-up Hdwy | - | - | 2.22 | - |
| Pot Cap-1 Maneuver | 0 | - | - | 506 |
| Stage 1 | 0 | - | - | - |
| Stage 2 | 0 | - | - | - |
| Platoon blocked, % | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | - | 506 |
| Mov Cap-2 Maneuver | - | - | - | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | - | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-----|------|----|
| HCM Control Delay, s | 0 | 0.2 | 38.9 | 65 |
| HCM LOS | | | E | F |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h) | 171 | - | - | 506 | - | - | 66 |
| HCM Lane V/C Ratio | 0.39 | - | - | 0.029 | - | - | 0.092 |
| HCM Control Delay (s) | 38.9 | - | - | 12.3 | - | - | 65 |
| HCM Lane LOS | E | - | - | B | - | - | F |
| HCM 95th %tile Q(veh) | 1.7 | - | - | 0.1 | - | - | 0.3 |

200: Grand River Avenue & W. Mall Driveway Performance by approach

| Approach | EB | WB | SB | All |
|--------------------|-----|-----|-----|-----|
| Denied Del/Veh (s) | 0.5 | 0.0 | 0.0 | 0.3 |
| Total Del/Veh (s) | 1.9 | 2.4 | 2.0 | 2.0 |

Intersection: 200: Grand River Avenue & W. Mall Driveway

| Movement | EB | WB | WB | SB | SB |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served | L | T | T | R | R |
| Maximum Queue (ft) | 116 | 96 | 96 | 48 | 5 |
| Average Queue (ft) | 53 | 50 | 25 | 9 | 1 |
| 95th Queue (ft) | 95 | 94 | 65 | 29 | 3 |
| Link Distance (ft) | | 106 | 106 | 123 | 123 |
| Upstream Blk Time (%) | | 0 | 0 | | |
| Queuing Penalty (veh) | | 0 | 0 | | |
| Storage Bay Dist (ft) | 500 | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |