

**Planning Commission**  
**CITY HALL COUNCIL CHAMBERS**  
**AGENDA OF SEPTEMBER 9, 2025**  
**7:00 PM**

**REVISED**

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**ROLL CALL**

**PLEDGE OF ALLEGIANCE**

**APPROVAL OF MINUTES**

Regular meeting minutes of June 10, 2025

**CORRESPONDENCE**

Administrative Approvals

1. PPZ2025-0362 Wendy's, 34273 Center Ridge Rd  
Administrative Approval of a Planning Commission application to make exterior alterations.
2. PPZ2025-0364 The Davey Tree Expert Co., 34445 Mills Rd  
Approval of a Certificate of Zoning Compliance for a landscape service company.
3. PPZ2025-0367 Studio Metamorphosis, 39160 Center Ridge Rd, Unit 2  
Approval of a Certificate of Zoning Compliance for a salon and office space.
4. PPZ2025-0368 Moore's Family Automotive LLC, 33549 Liberty Parkway, Unit 2  
Approval of a Certificate of Zoning Compliance for automotive repair.
5. PPZ2025-0369 Manning Law LLC, 36591 Center Ridge Rd, Suite 105  
Approval of a Certificate of Zoning Compliance for professional offices.
6. PPZ2025-0370 Scale Technology Group, 36591 Center Ridge Rd, Suite 102  
Approval of a Certificate of Zoning Compliance for professional offices.
7. PPZ2025-0371 Sculpted Symmetry North Ridgeville, 37723 Center Ridge Rd  
Approval of a Certificate of Zoning Compliance for a medical spa.
8. PPZ2025-0373 Together In Play, 8540 Root Rd, Room, 220  
Approval of a Certificate of Zoning Compliance for Nonprofit - playgroups.

9. PPZ2025-0375 Dent Solutions Now, 6287 Lear Nagle Rd, Unit 5  
Approval of a Certificate of Zoning Compliance for automotive repair.
10. PPZ2025-0377 Jimmy John's, 34522 Center Ridge Rd  
Administrative Approval of a Planning Commission application for exterior building alterations for new business.

## **OLD BUSINESS**

## **NEW BUSINESS**

1. PPZ2025-0366: Panda Express, 32429 Cook Rd, PPN 07-00-003-102-104, -045, -046  
Applicant: Phillip Meador, Heights Venture Architects, 5741 Legacy Dr, Suite 320, Plano, TX 75024. Owner: BOBKOB 32425 LLC, 4343 Thorn Ridge Circle, Cleveland, OH 44135. Proposal consists of constructing a new drive through restaurant. Property zoned B-3 Highway Commercial District.
  2. PPZ2025-0372: Kaitlyn Culp, White Rose Ballet Academy, 6287 Lear Nagle Rd, Unit 4, PPN: 07-00-008-115-067  
Owner: Liberty Parkway HRD LLC, 25255 Center Ridge Rd, Westlake, OH 44145. Referral from Director of Planning and Development for similar use determination. Property is zoned I-2 Light Industrial District.
- O 2025-110 An Ordinance amending Sections 1268.02, 1270.02, and 1272.04 of the North Ridgeville Zoning Code to update use regulations for automobile service stations and gasoline stations.  
(Introduced by Councilman Abens; First Reading on 07-21-2025; Council referred to Planning Commission and Building and Lands on 07-21-2025; to Building and Lands on 08-18-2025)
4. Ridgeville Farms Senior Housing, 7691 Avon Belden Rd, PPN: 07-00-022-101-103  
Applicant: Bramhall Engineering, 801 Moore Rd, Avon, OH 44011. Owner: SLK Capitol Holdings, LLC, 28400 Hilliard Blvd, Westlake, OH 44145. Requesting a street name change.

## **ADJOURNMENT**

**NORTH RIDGEVILLE PLANNING COMMISSION  
MINUTES OF REGULAR MEETING  
TUESDAY, JUNE 10, 2025**

**CALL TO ORDER**

Chairman Smolik called the Planning Commission meeting to order with the Pledge of Allegiance at 7:00 PM.

**ROLL CALL**

Present were members Frank Toth, Steve Ali, Council Liaison Bruce Abens and Vice-Chairman Paul Schumann.

Chairman James Smolik was excused.

Also present were Assistant Law Director Toni Morgan, City Engineer Christina Eavenson, Planning and Development Director Kimberly Lieber, City Arborist Ryan Thomas and Deputy Clerk of Council Tina Wieber.

**MINUTES**

Vice-Chairman Schumann asked if the members had a chance to review the minutes of the regular meeting on May 13, 2025. He asked if there were any corrections. Hearing none, the minutes were approved as submitted.

**CORRESPONDENCE**

**Administrative Approvals**

Director Lieber noted the following administrative approvals:

**PPZ2025-0352 Center Ridge Dental, 33650 Center Ridge Rd**

Approval of a Certificate of Zoning Compliance for a dental office.

**PPZ2025-0353 Tavo's Tacos, 33137 Center Ridge Rd**

Approval of a Certificate of Zoning Compliance for a restaurant.

**OLD BUSINESS**

**Master Tree Plan**

Vice-Chairman Schumann opened discussion on the Master Tree Plan.

Member Toth expressed strong support for the plan, particularly the memorial tree planting program, citing community interest in similar programs such as the Veterans Memorial banners on Bainbridge.

Moved by Toth and seconded by Ali to approve the Master Tree Plan.

A roll call vote was taken and the motion carried.

Yes – 4 No – 0

**NEW BUSINESS**

**PPZ2025-0354: Harvest Ridge Church, 35544 & 35600 Lorain Rd, PPN: 07-00-024-101-101, -109**

Owner: Michael Moyes, Dobie Pallets, 35544 Lorain Rd, North Ridgeville, OH 44039. Proposal consists of rezoning parcel number 07-00-024-101-101 located at 35544 Lorain Road that is currently zoned I-2 Light Industrial District, and the eastern portion of parcel number 07-00-024-101-109 located at 35600 Lorain Rd that is currently zoned I-2 Industrial District be rezoned to R-1 Residence District.

Application was read.

Vice-Chairman Schumann asked Director Lieber for findings of fact.

Director Lieber presented the request noting that the church was expanding eastward and cleaning up existing split zoning on its property and explained that churches were not permitted in I-2 District, so the change would legalize the current use. She stated that the action aligned with the City's Master Land Use Plan, which identifies the site for civic/semi-public use. She indicated that the rezoning would not disrupt the surrounding mix of uses along Lorain Road.

Vice-Chairman Schumann asked if there was a representative for the application present.

Kevin Crowe, Harvest Ridge Church, 9049 Reed Rd, North Ridgeville, OH 44039.

Mr. Crowe stated that he had been the pastor at Harvest Ridge Church since its founding 33 years ago. He expressed his intent to enhance the area and potentially maintain some land as green space or farmland.

Vice-Chairman Schumann asked if there were any questions or comments from the public.

Raymond Allison, 35793 Chestnut Ridge Road, North Ridgeville, OH 44039.

Mr. Allison inquired about plans for the church-owned land across the highway.

Mr. Crowe stated that they intended to maintain that as farmland.

Council Liaison Abens asked why the zoning change was to R-1 rather than B-2 or B-3 and sought clarification on adjacent property zoning.

Director Lieber clarified current zoning and confirmed that only the listed parcels were part of the rezoning request to clean up split zoning.

Moved by Toth and seconded by Ali to approve the application.

A roll call vote was taken and the motion carried.

Yes – 4 No – 0

**PPZ2025-0357: North Ridgeville High School, Phase 2, 34610 Bainbridge Rd, PPN 07-00-016-104-233**

Applicant: Claire Bank, ThenDesign Architecture, 4230 River St, Willoughby, OH 44094. Owner: North Ridgeville City Schools, 34260 Bainbridge Rd, North Ridgeville, OH 44039. Proposal consists of constructing a new high school and demolition of old high school. Property zoned R-1 Residence District.

Application was read.

Vice-Chairman Schumann asked Director Lieber if she would give her findings of fact.

Director Lieber stated that she would give her comments following the applicant's presentation.

Vice-Chairman Schumann asked if there was a representative for the application present.

Claire Bank, ThenDesign Architecture, 4230 River St, Willoughby, OH 44094.

Ms. Bank reviewed the updated site layout which now included additional parking data, reoriented stormwater basins and driveways to improve residential buffering and new crosswalks for pedestrian safety. She also shared updated building elevations and setbacks stating that the tallest portion was the fly for the stage, which was where the scenery would be pulled up off of the stage and was over 200 feet from the site boundary and set back over shorter areas of the building to scale down to be more appropriate to the surrounding residential scale. She stated they provided an updated landscape plan to replace certain trees such as the oaks, to reduce acorns dropping, to provide privacy screening along the eastern boundaries with various tree species. She presented visual diagrams and explained efforts to maintain harmony with nearby residential areas. She then provided a comprehensive walkthrough of the proposed high school site and building layout:

- **Building Organization:**
  - Visual arts and music spaces located near the front, single-story but designed for creative functionality and acoustics.
  - Athletic facilities, including the natatorium, competition gym, and auxiliary gym, are located near the stadium.
  - Main academic areas include two-story structures with science classrooms on the first floor and humanities on the second.
- **Entry Points:**
  - The main entrance, indicated by a large triangle, will be the primary access point for visitors during school hours, complete with screening.
  - Smaller triangles represent secondary entries used by students or event attendees.
- **Design Features:**
  - A focus on campus integration with material continuity from the existing Academic Center.
  - Timeless architectural styling to ensure longevity.
  - Building materials include brick in multiple tones, red accent bands, fiber cement caps, and North Ridgeville blue paneling.
  - Design considers student security and weather protection at entry points.
  - Emphasis on daylighting and appropriate acoustics in creative and music spaces.
  - Main entrances are intentionally prominent and easily identifiable.
- **Community Engagement:**
  - A visual preference survey conducted in April 2024 with 1,500+ participants helped guide design aesthetics and material selection.

- Site Features Highlighted:
  - School store located near the main entry.
  - Performing Arts Center on the north side, accessible from its own entrance and parking.
  - Weight room, student dining, and Ranger Academy placed centrally for accessibility.

Joe Killian, Construction Manager for Hammond, 1550 Corporate Woods Parkway, Uniontown, Ohio 44685.

Mr. Killian presented slides showing the different phases of construction:

- Summer 2025:
  - Active construction at both transportation/maintenance center and high school site.
  - Overflow parking being installed west of the site along Bainbridge.
- September 2025:
  - Temporary stone parking completed.
  - West parking lots near completion.
  - Continued progress on transportation/maintenance center.
- December 2025 – February 2026:
  - Transportation and maintenance center near completion.
  - Demolition of existing maintenance building begins.
  - Construction trailers move to the old bus garage area.
- May 2028:
  - High school construction complete.
  - All fencing removed.
  - Final traffic routing and access finalized.

Vice-Chairman Schumann asked Director Lieber to present her findings of fact.

Director Lieber discussed her review:

- Parking: Minimum requirements met. 1,269 spaces proposed; 1,139 required.
- Bike Parking & Crosswalks: Request for these to be included in the updated site plan.
- Lighting: Updates in progress. Variances may be required and will go to BZA. Photometric plan pending.
- Setbacks: Compliant with City code.
- Dense buffering Along Pitts Blvd: Shift from fencing to natural landscape screening. Arborist recommendations are still under review.

Vice-Chairman Schumann confirmed that lighting, bike parking and crosswalks should be included in any motion for conditional approval. He inquired about clarity regarding buffering recommendations.

City Arborist Thomas stated that he was awaiting review of the updated landscape plan received earlier that day and would provide comment upon further review.

Ms. Bank confirmed buffer density was increased in the updated plan and emphasized reliance on the landscape architect's projections for final mature growth and spacing.

City Engineer Eavenson reinforced the need for a 4-foot buffer at ends of parking rows for safety. She requested an auto-turn analysis for fire truck access and referred to the Fire Department's additional comments regarding fire lines, carbon monoxide detection and hazardous material protocols.

Assistant Law Director Morgan stated that her only additional comment related to safety was ensuring that fire recommendations were reviewed and approved by the Fire Chief or appropriate personnel. Otherwise, she stated it was a great project.

Vice-Chairman Schumann asked if there were any other questions or comments from the Commission.

Council Liaison Abens inquired about the capacity of the new high school.

Ms. Bank stated that the new high school was designed for 1,692 students, while the current enrollment was approximately 1,400.

Council Liaison Abens questioned if an increase of only 100–200 students was expected over the next 15 years. He also addressed the buffer zone on the east side, recommending close coordination with the City's Arborist, noting minimal school activity planned on that side. He asked for clarification on the four-foot buffer, referencing its location.

City Engineer Eavenson discussed the parking lot design, particularly the ends of tree aisles. She noted that typically a striped or curved island served as a buffer at end caps, and that some areas included this while others did not. Recommendations were made to ensure those features were consistently applied.

Member Toth inquired about the right-turn in/out restriction on the eastern Bainbridge Road access point.

Ms. Bank responded that, through discussions with the City, it was determined signage would be used to encourage only right turns in/out of the student lot to improve traffic flow and reduce backups. No physical barrier will be installed to prevent left turns.

Vice-Chairman Schumann asked if there were any comments or questions from the public.

Matthew Crowe, 35718 Lorain Rd, North Ridgeville, OH 44039.

Mr. Crowe introduced himself as a high school boys' soccer coach. He praised the design and asked if any provisions had been made for future building expansion, especially if enrollment exceeded projections due to new housing developments.

Ms. Bank responded that responded that the building accommodates the current 10-year enrollment forecast but does offer flexibility for growth, but no formal land banking had been established at that time.

Vice-Chairman Schumann asked if Superintendent Roxanne Casario had any comments regarding the project.

Roxanne Casario, 34620 Bainbridge Rd, North Ridgeville, OH 44039.

Superintendent Casario expressed gratitude to the City and all project partners. She highlighted the community involvement, noting over 1,000 touchpoints with stakeholders, and emphasized the long-term value the new school would bring to the City.

Vice-Chairman Schumann asked if there were any further comments from the Commission.

None were given.

Moved by Schumann and seconded by Toth to approve the application with the following conditions:

1. Define bike parking and crosswalks on site plan.
2. Lighting plan will be administratively reviewed for zoning compliance.
3. Update the landscaping plan to ensure a dense buffer along Pitts Blvd properties in consultation with the City Arborist.
4. Provide 4-foot-wide end caps for each row of parking spaces in all parking lots.

A roll call vote was taken and the motion carried.

Yes – 4 No – 0

Member Toth commended all involved in bringing the project to this stage, particularly the Mayor, Superintendent, architects (TDA), and Hammond Construction.

**ADJOURNMENT**

Chairman Smolik adjourned the meeting at 7:48 PM.

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**James Smolik**  
*Chairman*

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**Tina Wieber**  
*Deputy Clerk of Council*

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Tuesday, July 8, 2025  
**Date Approved**

# Planning Commission Application

~~SECRET~~  
JUL 21 2025



## SUBMITTAL INSTRUCTIONS AND PROCEDURES

- Plan reviews will be carried out according to the processes described in the City's Zoning Code.
- **Pre-Application.** Prior to making application, applicants are recommended to contact the city to discuss their development project. City staff will outline the review process and provide a checklist of required submittals.
  - **Application Submittal.** Following the pre-application meeting, the applicant shall submit this completed application, fee and ten (10) sets of all required exhibits. All submissions shall be made in hard copy to the Building Division. Plans shall be collated, folded and easily legible.
  - **Staff Review.** The applicant shall attend a staff review meeting and may be required to submit additional information and/or revised plans based on staff input.
  - **Variations.** Where zoning variations are sought by the applicant, review by the Board of Zoning and Building Appeals will be necessary prior to consideration by the Planning Commission, requiring a separate application.
  - **Decision or Referral.** Following staff review, complete submittals for Administrative Review projects may be considered for approval. For Council Review projects, complete submittals shall be referred to the next available Planning Commission meeting, which are held the second Tuesday of each month.

## PROJECT INFORMATION

32429

32425 Cook Rd, North Ridgeville, OH 44039      0700003102104, 0700003102045, 0700003102046

Location address      Parcel number(s)

Project type:  Commercial/Industrial/Multi-Fam    Prelim Major Subdivision    Final Major Subdivision    Lot Split

Project elements:  New Construction    Building Addition/Alteration    Site Improvements    ~~Plus~~

Demo of existing building, consolidate 3 Parcels, and construct a new restaurant with Drive Thru

Project description

## APPLICANT/AGENT INFORMATION

Phillip Meador, AIA, NCARB - Heights Venture Architects - on Behalf of Panda Express INC.

Name/Company

5741 Legacy Drive, Suite 320, Plano, TX 75024

Applicant address

281.854.6174

Applicant phone

phillip.meador@hva.cc

Applicant email

## PROPERTY OWNER INFORMATION

BOBKOB 32425 LLC

Name/Company

4343 Thorn Ridge Circle, Cleveland, OH 44135

Property owner address

(216) 314-2419

Property owner phone

texchp@yahoo.com

Property owner email

Parcel: 0700003102045, 0700003102046

## AUTHORIZATION AND ACKNOWLEDGEMENT

Phillip Meador

Applicant signature

Digitally signed by Phillip Meador  
DN: cn=Phillip Meador, c=US, o=Heights Venture Architects,  
LLP, email=Phillip.Meador@hva.cc  
Date: 2025.01.24 09:43:38 -0600

Signed by:

Property owner signature

I hereby authorize the City of North Ridgeville, including Planning Commission members, to view the premises and consent to their entry onto the property for the purpose of observing site conditions related to review of my application.

OFFICE	PPZ No.	Planning Fee Paid	ACTION
	PPZ 2025-0366	150.00	

RECEIVED

JUL 21 2025

Planning Commission Application



SUBMITTAL INSTRUCTIONS AND PROCEDURES

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 Location address      Parcel number(s)

Project type:  Commercial/Industrial/Multi-Fam    Prelim Major Subdivision    Final Major Subdivision    Lot Split  
 Project elements:  New Construction    Building Addition/Alteration    Site Improvements    Plat

Demo of existing building, consolidate 3 Parcels, and construct a new restaurant with Drive Thru  
 Project description

APPLICANT/AGENT INFORMATION

Phillip Meador, AIA, NCARB - Heights Venture Architects - on Behalf of Panda Express INC.

Name/Company

5741 Legacy Drive, Suite 320, Plano, TX 75024

Applicant address

281.854.6174

Applicant phone

phillip.meador@hva.cc

Applicant email

PROPERTY OWNER INFORMATION

Cook Road Properties LLC

Name/Company

7670 Tyler Boulevard, Mentor, OH 44060

Property owner address

(440) 951-4470

Property owner phone

lance@osbornecapital.com

Property owner email

Parcel: 0700003102104

AUTHORIZATION AND ACKNOWLEDGEMENT

Phillip Meador

Applicant signature

Digitally signed by Phillip Meador  
DN: cn=Phillip Meador, o=US, ou=Heights Venture Architects,  
LLP, email=Phillip.Meador@hva.cc  
Date: 2025.01.24.08:43:53 -0800

*[Handwritten Signature]* authorized Agent  
Property owner signature

I hereby authorize the City of North Ridgeville, including Planning Commission members, to view the premises and consent to their entry onto the property for the purpose of observing site conditions related to review of my application.

OFFICE	PPZ No.	Planning Fee Paid	ACTION

## Planning Review

July 24, 2025

Project: Panda Express  
Location: 32429 Cook Road  
PPNs: 07-00-003-102-104, 07-00-003-102-045, 07-00-003-102-046  
District: B-3 Highway Commercial District

### Project Summary:

This proposal consists of a new drive through restaurant. Drive through restaurants are permitted in the B-3 Highway Commercial District. Panda Express presented their project earlier in 2025 and was denied. This is a new submittal with changes addressing many of staff and Planning Commission's concerns, specifically regarding access and circulation.

The project site consists of three parcels on Cook Road zoned B-3, including the vacant lot to the east of Starbucks and two adjacent parcels to the east with an existing commercial building used for an auto repair business that will be demolished. The three parcels will be consolidated as part of the project. All surrounding property is similarly zoned B-3 District.

The 2,700 square foot building façade will be comprised of a combination of stone, composite cladding and EIFS. The proposed dumpster enclosure is shown constructed out of EIFS applied as a stucco product over masonry with steel gates. A double drive through is shown. Code requires stacking for at least 10 vehicles and must be designed to allow vehicles to exit the waiting lane. A stacking exhibit shows 15 vehicles fully within the drive through with room for more stacking on site. The applicant has provided an escape lane.

A detailed landscape plan is included in the submittal. Ornamental landscaping is included along the road frontage and along the drive through. Landscaping and bioretention are included in the parking lot island.

The lighting plan shows light levels slightly in excess of code requirements. Parking lot lights will be mounted at 18 feet. Fixture cut sheets were provided for the pole lights.

A conceptual sign package was included in the submittal. Insufficient information exists to conduct a thorough zoning review of proposed signage. It is typical to receive a detailed sign package during the permitting process.

Currently, access along this stretch of Cook Road is frequent and poorly defined, not in conformance with access management standards. With this project, the existing curb cut to Starbucks and the auto repair building will be removed. One combined curb cut on the east side of the property is proposed, as far away from the Lorain-Cook intersection as possible. The curb cut will be three lanes, allowing for

both right and left turns out of the property. Panda Express provides cross access to Starbucks and will share parking spaces and the drive aisle adjacent to the Starbucks drive through for circulation.

Code requires one parking space for every 100 square feet of area or one per three seats, whichever is greater. Based on square footage, 27 spaces are required and 40 spaces are provided. Sidewalks are required for any new commercial construction. A sidewalk has been provided along with a pedestrian route to the building entrance. Bike parking is required for this use.

Truck turns were provided. The exhibit shows a 40-foot fire vehicle can traverse the site. A semi-truck must traverse the site by entering against drive through traffic. The applicant should clarify how deliveries are expected to occur on the site.

As previously stated, the most significant change to the Panda Express proposal was the relocation and combination of curb cuts. The site will have one access point rather than two with an additional poorly defined cross access. It was agreed by staff that the deceleration lane suggested in the applicant's TIS was less desirable, but that the combined curb cut relocation would have more positive benefits both to onsite traffic circulation and limiting offsite traffic impacts. Previously, a bank of four parking spaces was shown between two curb cuts directly where the drive through would also outlet. This unsafe condition has been eliminated with this new site plan.

Recommendations:

- Planning Commission should make lot consolidation a condition of approval.
- Provide bike parking per 1285.03(c).

# PANDA EXPRESS



S8-26-D36943

32425 COOK RD  
N. RIDGEVILLE, OH 44039



GENERAL		PLANNING	PLANNING
		01.28.25	07.08.25
G.001	TITLE SHEET	•	•
<b>CIVIL</b>			
C02.0	DEMOLITION	•	•
C03.0	SITE PLAN	•	•
C03.1	STAKING PLAN	•	•
C04.0	UTILITY PLAN	•	•
C05.0	GRADING AND DRAINAGE PLAN	•	•
<b>LANDSCAPING</b>			
LP01.01	LANDSCAPE PLAN	•	•
<b>ARCHITECTURAL</b>			
A-202	EXTERIOR ELEVATIONS COLORED	•	•
A-203	SIGNAGE	•	•
	SITE PHOTOMETRICS	•	



PANDA EXPRESS, INC.  
1683 Walnut Grove Ave.  
Rosemead, California  
91770  
Telephone: 626.799.9898  
Facsimile: 626.372.8288

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REVISIONS:

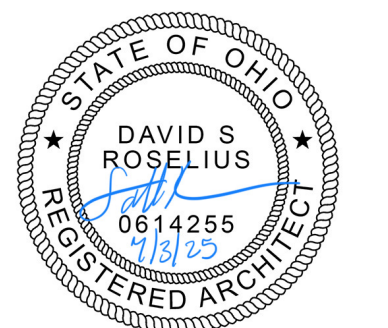
NO.	DESCRIPTION	DATE

ISSUE DATE:

PLANNING SET	01-28-25
PLANNING SET 2	07-08-25

DRAWN BY:

PANDA PROJECT #: S8-26-D36943  
PANDA STORE #: D36943  
ARCH PROJECT #: 24120



**Heights Venture**  
ARCHITECTURE • DESIGN

**HOUSTON**  
1111 North Loop West, Suite 800  
Houston, Texas 77008  
281.854.6100

**DALLAS**  
5741 Legacy Drive, Suite 320  
Plano, Texas 75024  
281.854.6100

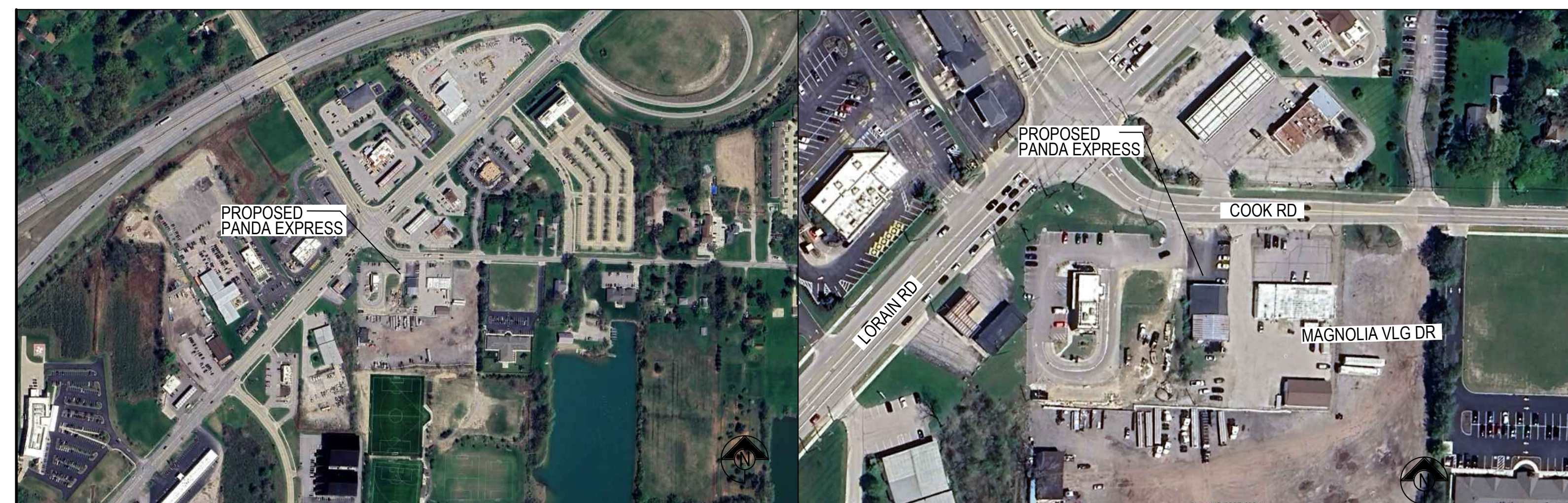
**CHICAGO**  
3333 Warrenville Road, Suite 200  
Lisle, Illinois 60532  
281.854.6100

**PANDA EXPRESS**  
PANDA HOME R3  
32425 COOK ROAD  
N. RIDGEVILLE, OH 44039

**G-001**

TITLE SHEET

PANDA HOME R4



VICINITY MAP

Scale= NTS G-001

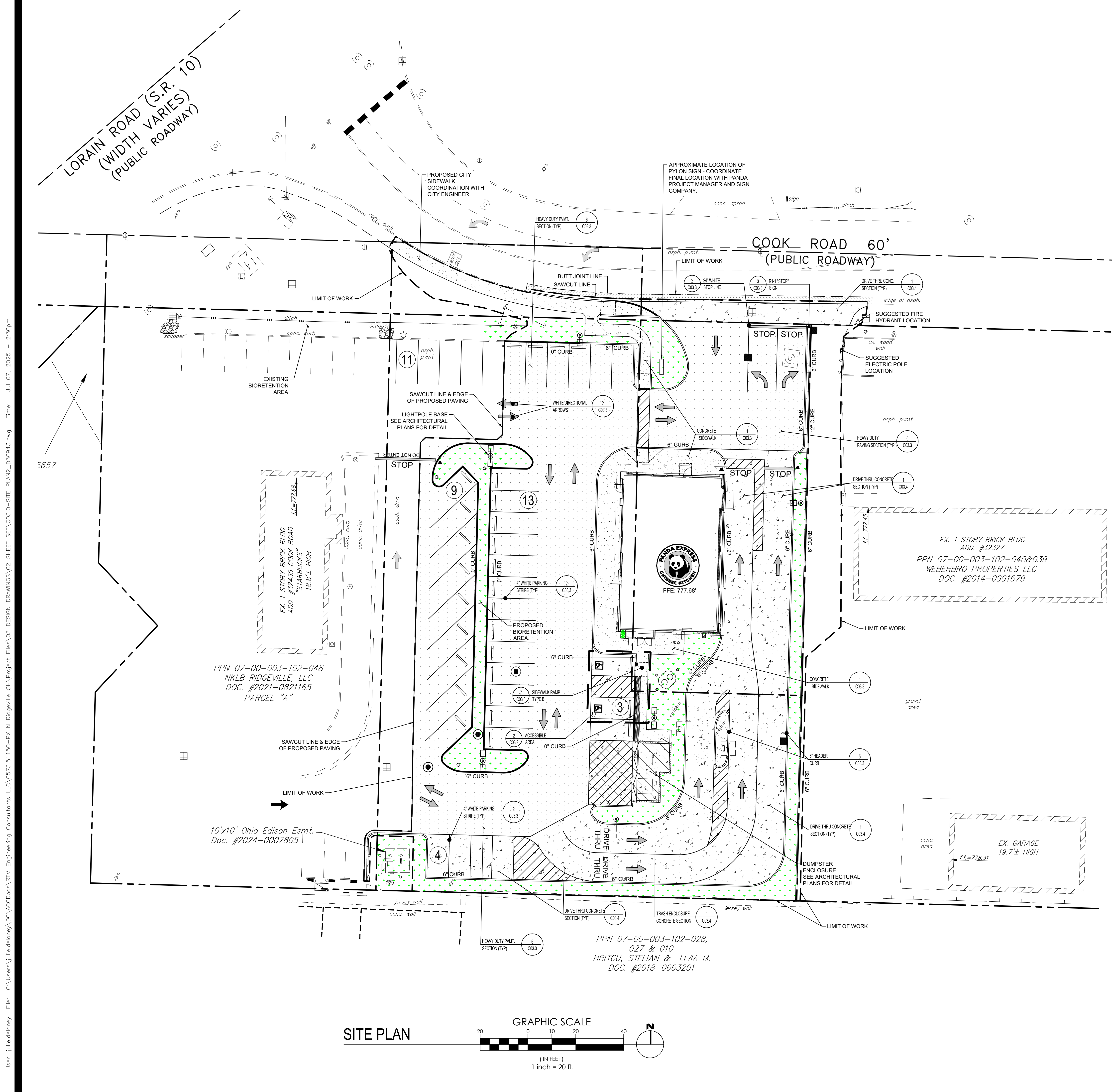
KEY PLAN

Scale= NTS G-001

SHEET INDEX

Scale= NTS G-001





### SITE INFORMATION

JURISDICTION: NORTH RIDGEVILLE, OHIO

PROPOSED PARKING  
 REGULAR 38  
 HANDICAP 2  
 TOTAL = 40

DRIVE AISLE WIDTH: 24'

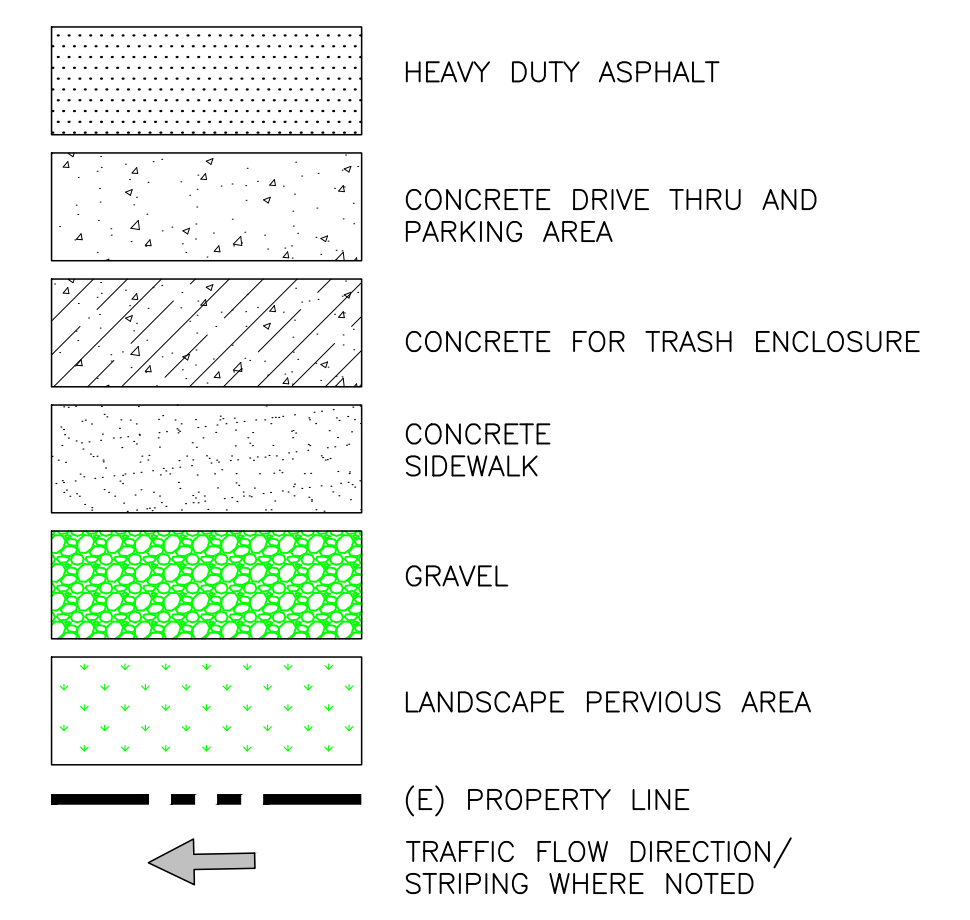
### PAVING NOTES

ALL GEOTECHNICAL PAVING SECTIONS ARE PER SEPARATE GEOTECHNICAL ENGINEERING REPORT BY TERRACON.

### SITE NOTES

- SEE ARCHITECTURAL PLANS FOR ADDITIONAL SIGNING, STRIPING AND BUILDING DETAILS.
- ALL STRIPING SHALL BE WHITE STRIPING APART FROM ADA.
- WHEEL STOPS TO BE RUBBER, NOT CONCRETE.
- STANDARD BOLLARDS SHALL BE PLACED AT BUILDING DT LANE BUILDING CORNER AND AT DT WINDOW. BOLLARDS SHALL HAVE THERMOPLASTIC COVER.
- CONCRETE SHALL BE PLACED BETWEEN BACK OF CURB AND FACE OF BUILDING TO ENSURE POSITIVE DRAINAGE AWAY FROM BUILDING.

### LEGEND



PANDA EXPRESS, INC.  
 1683 Walnut Grove Ave.  
 Rosemead, California 91770  
 Telephone: 626.799.9898  
 Facsimile: 626.372.8288

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#### REVISIONS:

NO.	DESCRIPTION	DATE

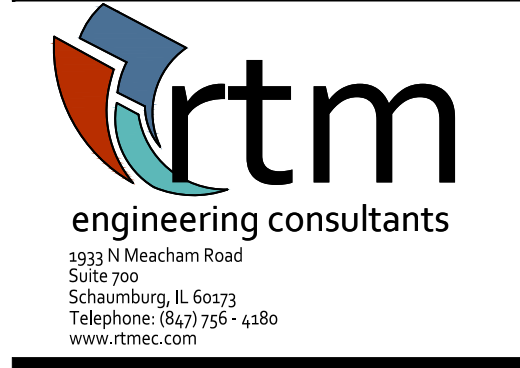
#### ISSUE DATE:

PLANNING	01-28-25
PLANNING	03-13-25
PLANNING	07-07-25

#### DRAWN BY:

rtm

PANDA PROJECT #: D36943  
 PANDA STORE #: -  
 ARCH PROJECT #: 24120

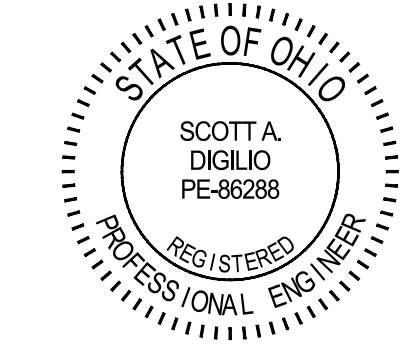


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### SITE PLAN

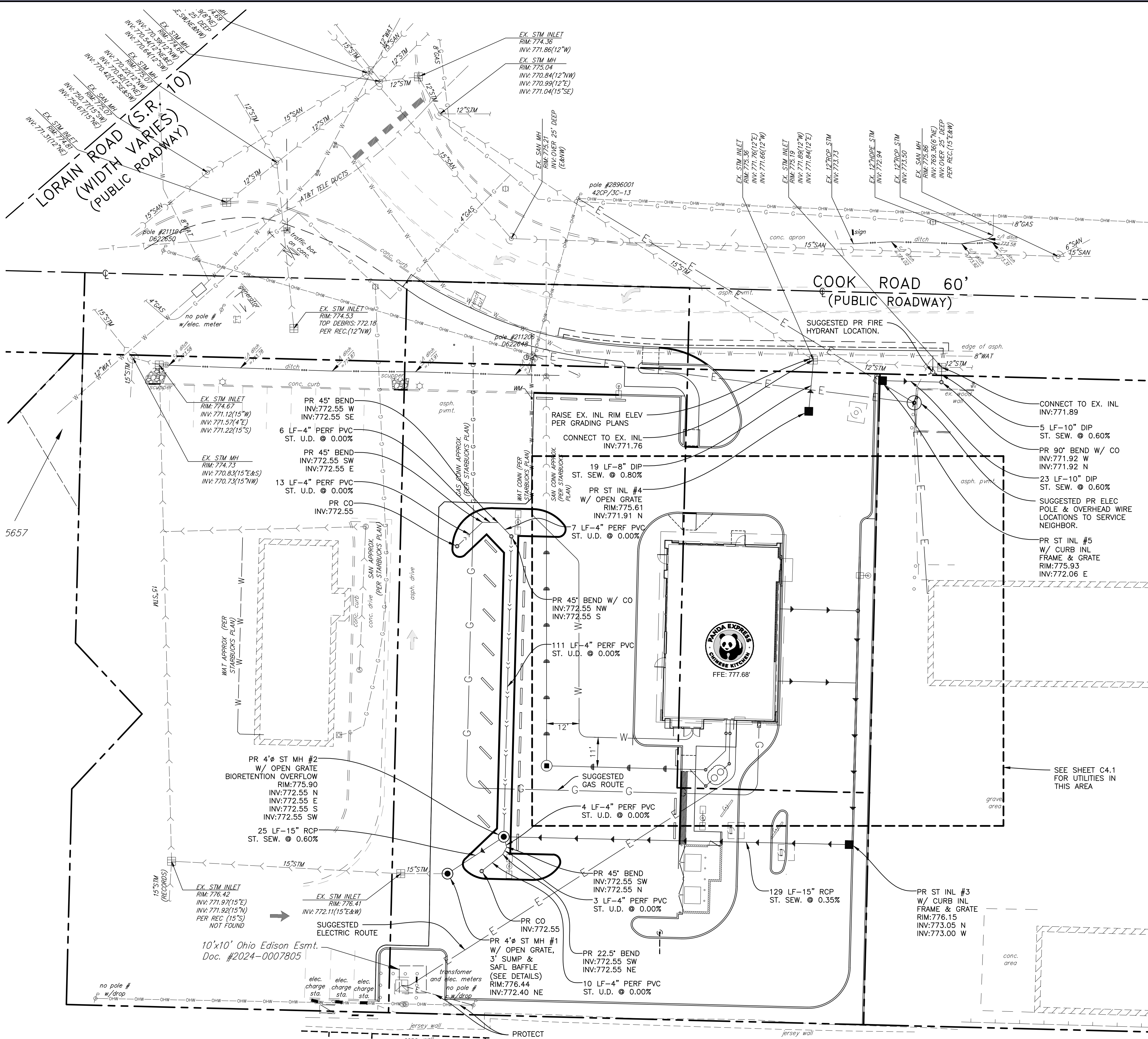
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**NOTES:**

- EX. ITEMS SHALL BE FIELD VERIFIED. RELOCATION OR ADJUSTMENT MAY BE NEEDED. CONTRACTOR TO VERIFY.
- CONTRACTOR SHALL VERIFY ALL WORK, INCLUDING BUT NOT LIMITED TO, SIZES, MATERIALS AND LOCATION, WITH UTILITY COMPANIES PRIOR TO INSTALLATION.
- VERIFY SERVICE LOCATIONS WITH BUILDING PLANS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
- RIM GRADES ALONG CURBS ARE FLOW LINE ELEVATIONS.
- SEE SPECIFICATIONS ON SHEET C01.3 AND C01.4 FOR ALL STORM, SANITARY, AND WATER PIPE AND STRUCTURE SPECIFICATIONS.
- ALL UTILITY TIE DIMENSIONS ARE FROM CENTER OF UTILITY AND TO BACK OF CURB WHEN TIED TO CURB LINES, UNLESS OTHERWISE NOTED.
- CONTRACTOR TO INSPECT EXISTING SEWER AT POINT OF CONNECTION. CONTRACTOR TO VERIFY THAT EXISTING PIPE IS IN GOOD WORKING CONDITION. CONTRACTOR TO REPAIR AS REQUIRED.
- CONTRACTOR TO NOTIFY OWNER/ENGINEER IF CONFLICTS OCCUR.
- NEW OPENING/CONNECTIONS TO EXISTING MANHOLE/STRUCTURES SHALL BE CORE-DRILLED.
- TEST PITS MUST BE EXCAVATED IN ADVANCE OF CONSTRUCTION IN ORDER TO CONFIRM DEPTH AND LOCATION OF EXISTING UTILITIES. NO ADDITIONAL PAYMENT WILL BE MADE FOR TEST PIT EXCAVATION.
- ALL NEW STORM STRUCTURES SHALL HAVE ADA COMPATIBLE OPEN LIDS, PER JURISDICTION STANDARDS.
- ALL UTILITY CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY CONSTRUCTION STANDARDS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL INSPECTIONS, CERTIFICATIONS, EQUIPMENT ETC., THAT MAY BE REQUIRED.
- CONTRACTOR SHALL COORDINATE GAS, ELECTRIC AND TELEPHONE CONDUIT, PIPING, AND CONDUCTOR REQUIREMENTS WITH MEP PLANS AND UTILITY PROVIDER PRIOR TO INSTALLATION.
- STREET ASPHALT PAVEMENT SHALL BE RESTORED IN ACCORDANCE WITH DOT REQUIREMENTS AND STANDARDS.



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NO.	DESCRIPTION	DATE

**ISSUE DATE:**

PLANNING	01-28-25
PLANNING	03-13-25
PLANNING	07-07-25

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PANDA PROJECT #: D36943  
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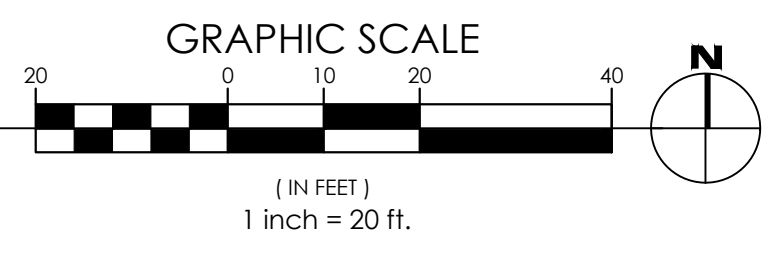
**UTILITY PLAN**

C04.0

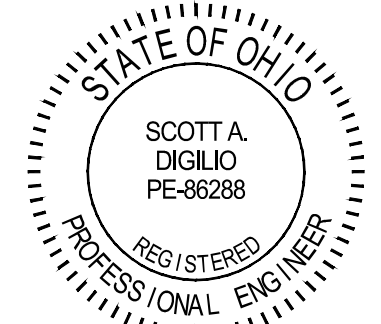
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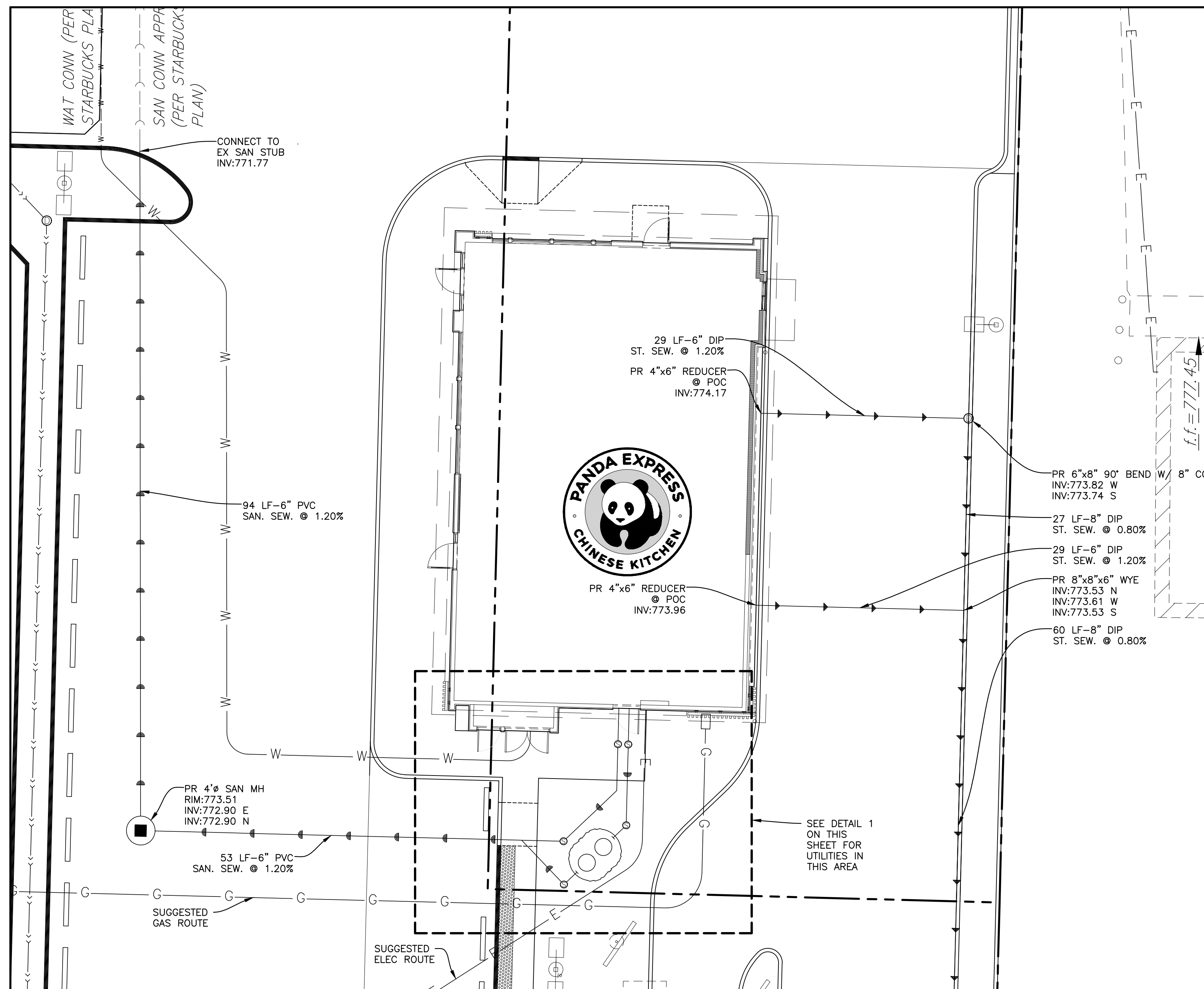
	EXISTING	PROPOSED		EXISTING	PROPOSED
SANITARY SEWER			CATCH BASIN/INLET		
SANITARY SERVICE			STORM MANHOLE		
STORM SEWER			SANITARY MANHOLE		
STORM SERVICE			VALVE BOX/VAULT		
WATERMAIN			FIRE HYDRANT		
GAS MAIN			B-BOX		
FIBER OPTIC LINE			LIGHTS (SEE BLDG PLANS)		
ELECTRIC LINE					
OVERHEAD WIRES					
TELEPHONE LINE					



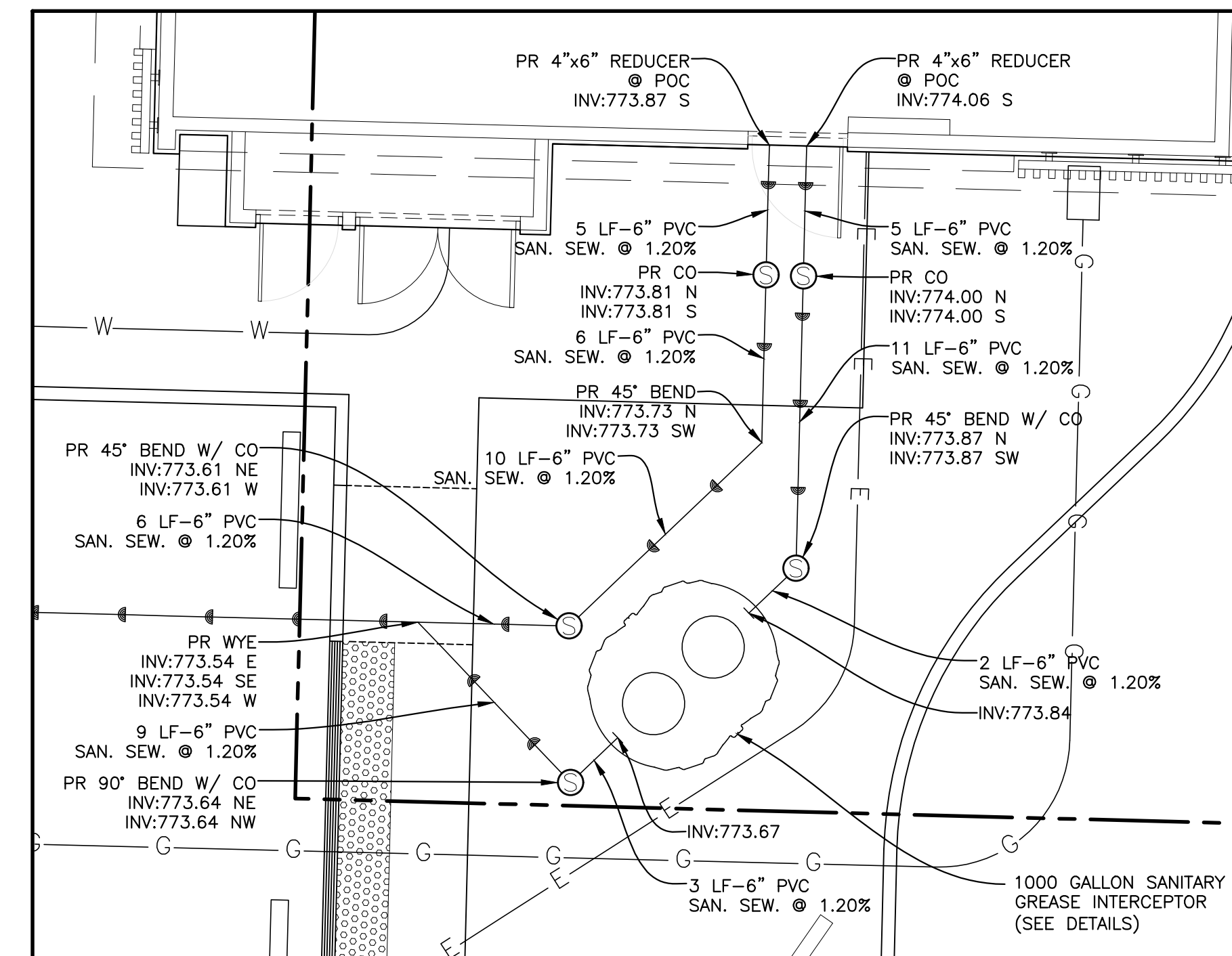
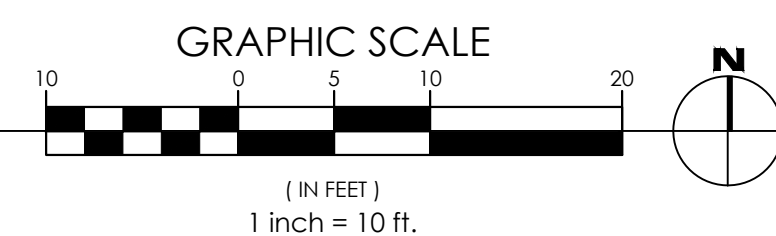
**UTILITY PLAN**



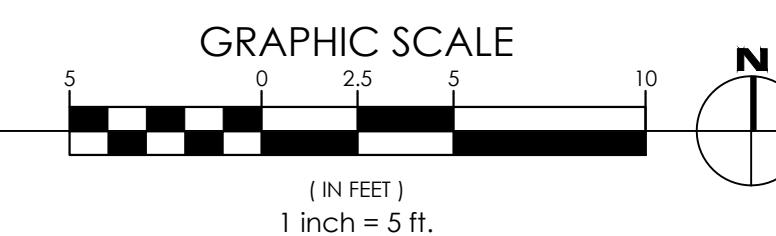
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BUILDING UTILITY PLAN



DETAIL 1



**NOTES:**

SEE C04.0

**LEGEND:**

	EXISTING	PROPOSED
SANITARY SEWER	--->---	--->---
SANITARY SERVICE	---	---
STORM SEWER	--->---	--->---
STORM SERVICE	---	---
WATERMAIN	---W---	---W---
GAS MAIN	---G---	---G---
FIBER OPTIC LINE	---FO---	---FO---
ELECTRIC LINE	---E---	---E---
OVERHEAD WIRES	---OH---	---OH---
TELEPHONE LINE	---T---	---T---
CATCH BASIN/INLET	○	●
STORM MANHOLE	○	●
SANITARY MANHOLE	○	●
VALVE BOX/VAULT	⊗	⊗
FIRE HYDRANT	⊗	⊗
B-BOX	⊗	⊗
LIGHTS (SEE BLDG PLANS)	☆	☆



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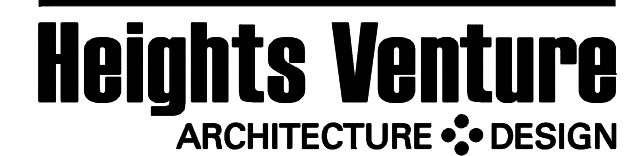
PLANNING	01-28-25
PLANNING	03-13-25
PLANNING	07-07-25

DRAWN BY: rtm

PANDA PROJECT #: D36943

PANDA STORE #: -

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Houston, Texas 77008  
281.854.6100

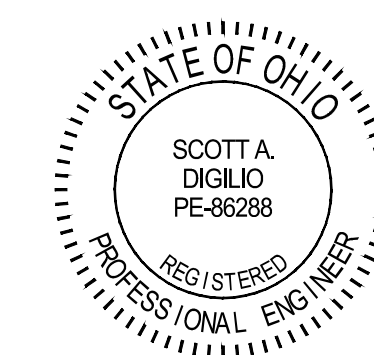
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UTILITY PLAN

C04.1



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**Notes:**

Location and elevation when given on the plans is top center of the grate. When side openings are provided, elevation shall be the low line of the side riser.

**Casting and Frame:** Casting to be East Jordan Iron Works No. 5110 W Type M2 Flat Grate or as approved equal. A 3/4" M3 or M4 may be required in a bicycle traffic environment.

**Basin:** concrete block or cast-in-place walls have a nominal thickness of 8 inches. Precast walls shall have a min. thickness of 6 inches and be reinforced sufficiently to permit shipping and handling without damage.

**2-2-B Grate:** elevation to be placed 4 to 6 inches below normal ditch returning to normal 10 feet each side of the basin.

The following text shall be cast into the top of the grate: **"DUMP NO WASTE" and "DRAIN TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of 0.5". "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc.

**Concrete:** cast in place, to be Class C. All precast concrete shall meet the requirements of 706.13.

**Openings:** for pipes shall be O.D. +2" when fabricated or cast in place.

**Maximum Depth:** is 4'-0".

**Backfill:** for structures within 5' of all pavement, driveways and sidewalks shall be CDOT Item 304 Aggregate Base or Low Strength Mortar Backfill, TYPE 2 per current O.D.O.T. Construction and Material Specifications, except as modified herein.

**The use of Foundry Sand or Slag is strictly prohibited.**

**Side Inlets:** shall be provided on both sides of the No. 2-2-B catch basins in sags and on upstream side only where the ditch has a continuous down grade past the catch basin.

**Concrete:** cast in place, to be Class C. All precast concrete shall meet the requirements of 706.13.

**Openings:** for pipes shall be O.D. +2" when fabricated or cast in place.

**Maximum Depth:** is 4'-0".

**Backfill:** for structures within 5' of all pavement, driveways and sidewalks shall be CDOT Item 304 Aggregate Base or Low Strength Mortar Backfill, TYPE 2 per current O.D.O.T. Construction and Material Specifications, except as modified herein.

**The use of Foundry Sand or Slag is strictly prohibited.**

SECTION A-A  
SECTION B-B

PLAN  
SECTION C-C

**STANDARD No. 2-2-B CATCH BASIN**

SCALE: NOT TO SCALE  
DATE: 10/01/08 | DRWN BY: JAB/TJB  
CITY OF NORTH RIDGEVILLE, ENGINEER

REV. NO.	DATE	BY	DESCRIPTION

**CATCH BASINS  
2-2-B**

SCALE: NOT TO SCALE  
DATE: 10/01/08 | DRWN BY: JAB/TJB  
CITY OF NORTH RIDGEVILLE, ENGINEER

**Notes:**

Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.

**TOP AND TRANSITION** (or reduced) Sections may be either eccentric cone, or flat slab.

**BASES** for manholes are shown with monolithic floor and riser which may be cast in one or two operations. A permissible alternative is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipe shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete precast in the base or by field construction. Bases may also be poured in place. All inlets and outlets are to be identified.

**OPENINGS IN RISER SECTIONS** for 18" and smaller inlet pipes shall be precast.

**MATERIALS** for bases and other precast sections, including reinforcement not specified herein, shall comply with the specifications.

**LANDING PLATFORMS** as shown on the Landing Details shall be installed in manholes that are over 20 feet deep to the insert with maximum vertical spacing of 20 feet.

**PRECAST MANHOLE** shall conform to the requirements of ASTM C-378. Concrete shall be 4000# P.S.I.

**SEAL** lift holes with approved concrete plugs and bit.

**ANCHORS** 1/2" dia. All nuts with washers and hex nut (Min 4). Lead anchor secured into the eccentric cone top.

**CASTINGS** for manholes shall be cleaned and painted in field with one coat of asphalt varnish or coal tar pitch paint.

48" BASE FOR PRECAST  
30" AND SMALLER PIPE

DOGHOUSE CONSTRUCTION

Base I.D.	Min "T"	Max. Pipe Size
48"	5"	30"
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7-1/2"	60"
96"	8"	60"

**PRECAST CONCRETE  
MANHOLE**

SCALE: NOT TO SCALE  
DATE: 10/01/08 | DRWN BY: JAB/TJB  
CITY OF NORTH RIDGEVILLE, ENGINEER

**ROADSIDE INLET**

**YARD INLET  
GENERAL AREA**

\* PIPE SIZE AS DIRECTED BY THE ENGINEER (MINIMUM 12")

CATALOG No.				
*	**	*	**	PIPE SIZE
EAST JORDAN	EAST JORDAN	NEENAH	NEENAH	12"
6562	6012	R-4340-H	R-4330-12	12"
6553	6215	R-4340-G	R-4200-18	18"
6554	6218	R-4340-F1	R-4200-18	18"
6536	6244V1	R-4340-F	R-4200-24	24"

OTHER CASTINGS ACCEPTED UPON APPROVAL OF THE CITY ENGINEER

\* INDICATES DOMED OR BEEHIVE GRATE CATALOG No.  
\*\* INDICATES FLAT GRATE CATALOG No.

**ROADSIDE & YARD  
INLET DETAILS**

SCALE: NOT TO SCALE  
DATE: 10/01/08 | DRWN BY: JAB/TJB  
CITY OF NORTH RIDGEVILLE, ENGINEER

**TYPICAL TRENCH DETAIL  
MAINLINE AND LATERALS**

Blue waterline tape to be installed 12" above top of waterline. (WATERLINE ONLY)

Installed in lifts and compacted with vibratory equipment.

Premium backfill shall be used under all existing or proposed pavements including, driveways, sidewalks and service walks. Premium shall extend 5' beyond edge of all roadway pavement (existing or proposed).

The use of L.S.M. For backfill may be required and will be determined by the City Engineer.

Install a #10 solid tracing wire at the bottom of the trench prior to placing the stone bedding. The wire is to continue through the water main boxes. (WATERLINE ONLY)

Premium backfill shall consist of course interlocking aggregate no. 57, #8 and #8 (lateral connections only).

Pipe cover shall consist of course interlocking aggregate no. 57, or 8 for 60" or smaller diameter pipes, for 66" or larger diameter pipe No. 4, #57 and #8 aggregate may also be used.

Bedding for pipe shall conform to ASTM D-2321.

All Material substitutions must be approved by the City Engineer.

**TRENCH DETAIL**

SCALE: NOT TO SCALE  
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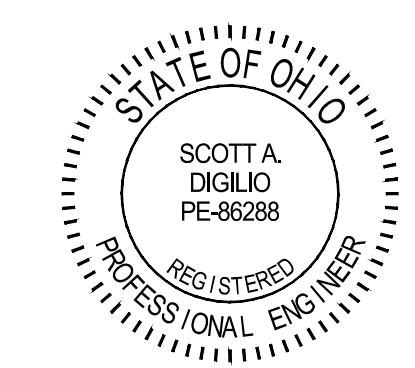
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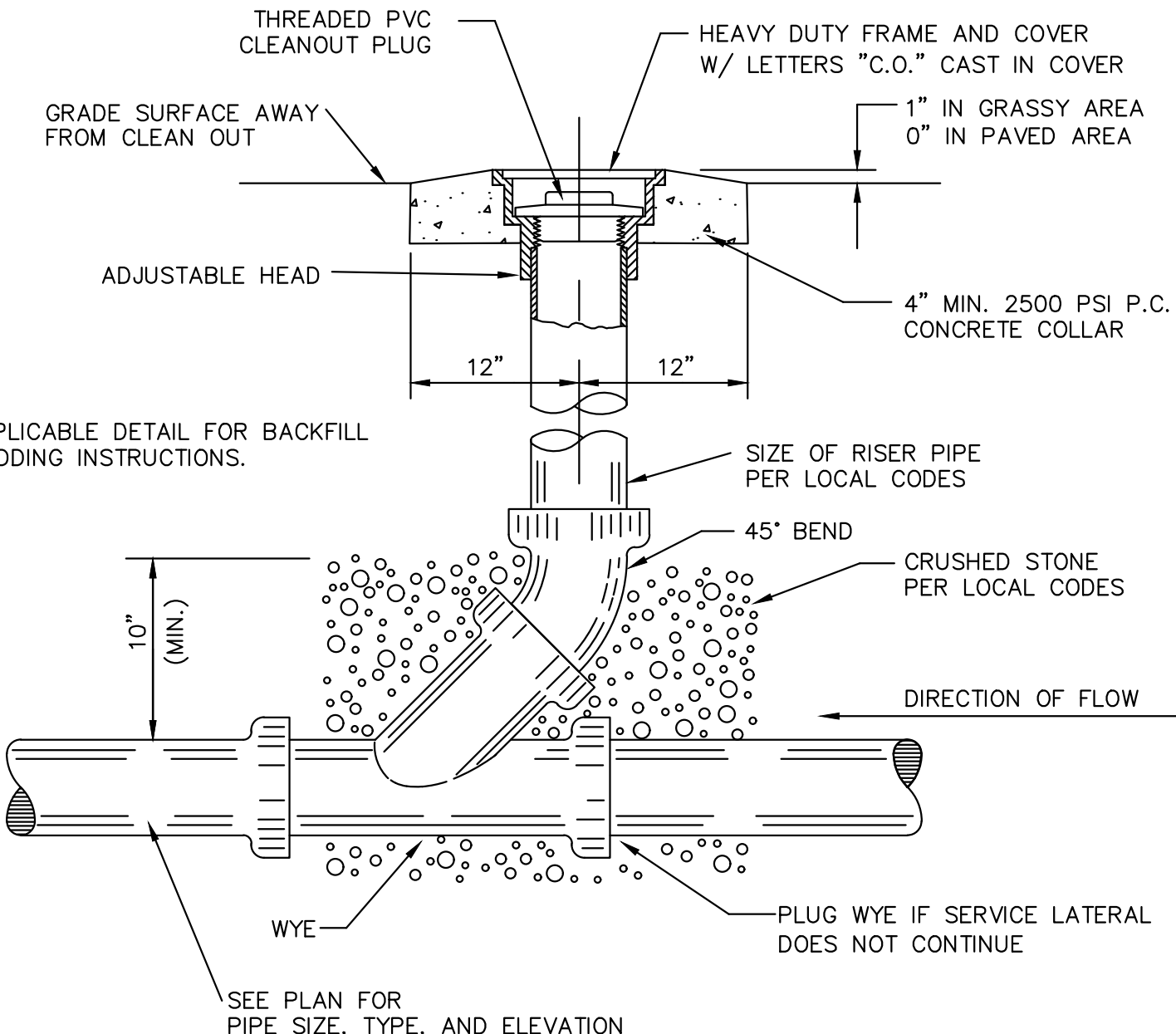
UTILITY DETAILS

C04.2

PANDA HOME R4



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**SEWER CLEAN-OUT**  
NOT TO SCALE

**SPECIFICATIONS**

- Notes:
- 6" plain end inlet/outlet
  - Unit weight - w/ cast iron covers: 824 lbs. (for wet weight add 8,413 lbs.)
  - Maximum operating temperature: 150° F continuous
  - Capacities - Liquid: 1,000 gal.;  
Grease: 5,495 lbs. (753 gal.) @100GPM  
Grease: 4,959 lbs (679 gal.) @200GPM  
Solids: 211 gal.
  - Satisfies Miami DERM 99% efficiency requirements; retaining the following capacities at 99.0% efficiency:  
5,272 lbs. (722 gal.) @100GPM  
3,127 lbs. (428 gal.) @200GPM
  - For gravity drainage applications only.
  - Do not use for pressure applications.
  - Cover placement allows full access to tank for proper maintenance.
  - Vent not required unless per local code.
  - Engineered inlet and outlet diffusers with inspection ports are removable to inspect / clean piping.
  - Integral air relief / Anti-siphon / Sampling access.
  - Adjustable cover adapters provide up to 4" of additional height.
  - Designed for below-grade, above-grade, indoor or outdoor installations.
  - Safety Star®, access restrictor built into each cover adapter, prevents accidental entry to tanks (450 lb rating).

**ENGINEER SPECIFICATION GUIDE**

Schier Great Basin™ grease interceptor model # GB-1000 shall be lifetime guaranteed and made in USA of seamless, molded polyethylene with minimum 7/16" uniform wall thickness. Interceptor shall be furnished for above or below-grade installation with adjustable cover adapter and Safety Star® access restrictor built into each cover adapter. Interceptor shall be certified to ASME A112.14.3 (Type D) and CSA B481.1 as well as certified to IAPMO/ANSI Z1001-2021. Interceptor flow rate shall be 100 GPM or 200GPM. Interceptor grease capacity shall be 5,495 lbs. Cover shall provide water/gas-tight seal and have minimum 16,000 lbs. load capacity.

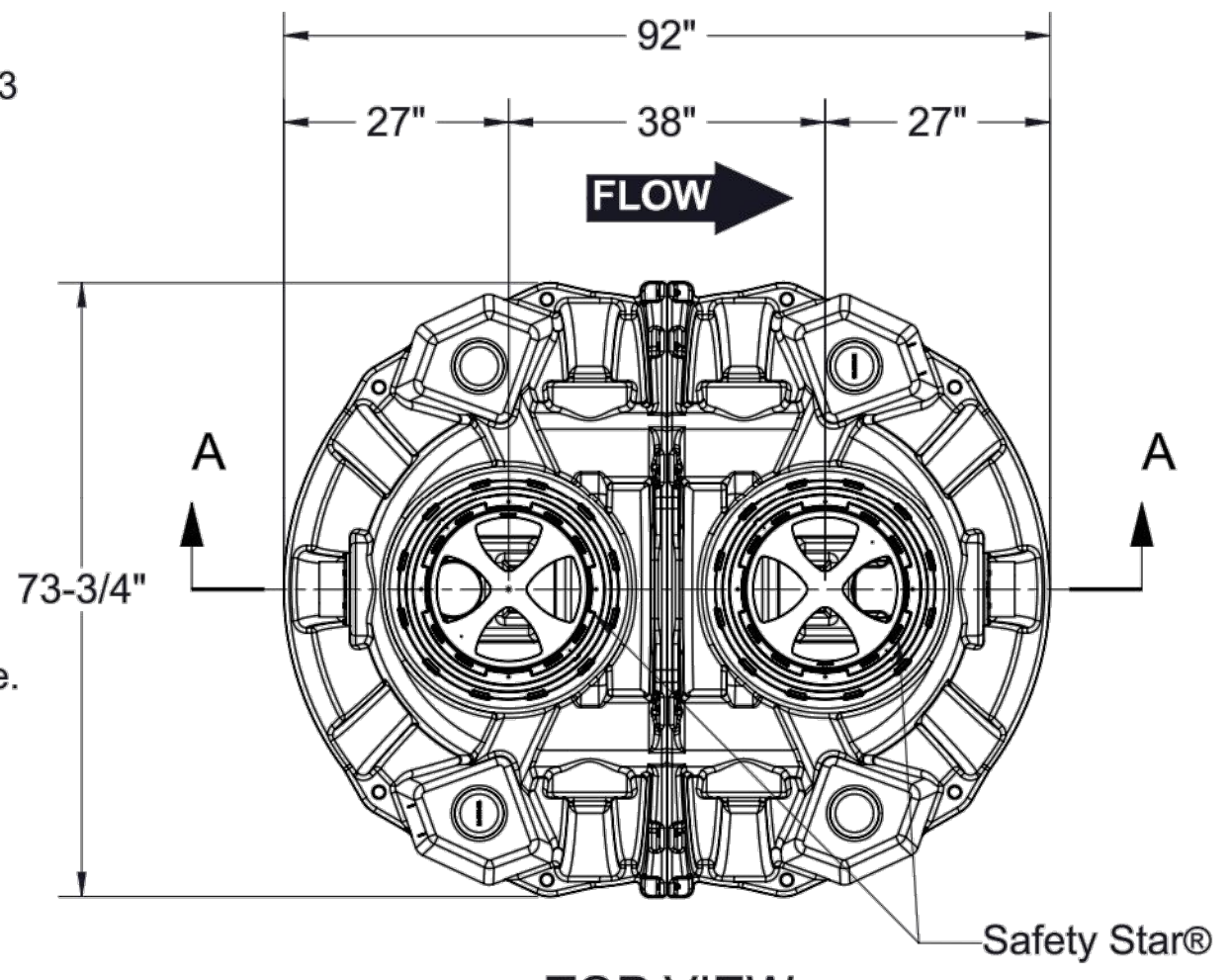
**CERTIFIED PERFORMANCE**

Great Basin™ hydromechanical grease interceptors are third party performance-tested and listed by IAPMO to ASME #A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.

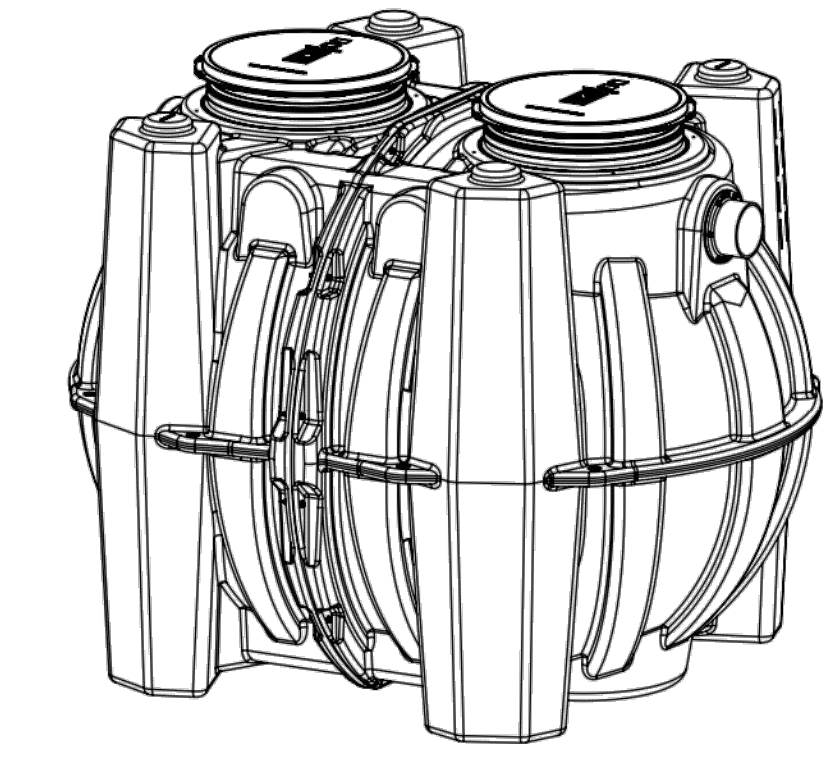
Type D certification does not require a flow control



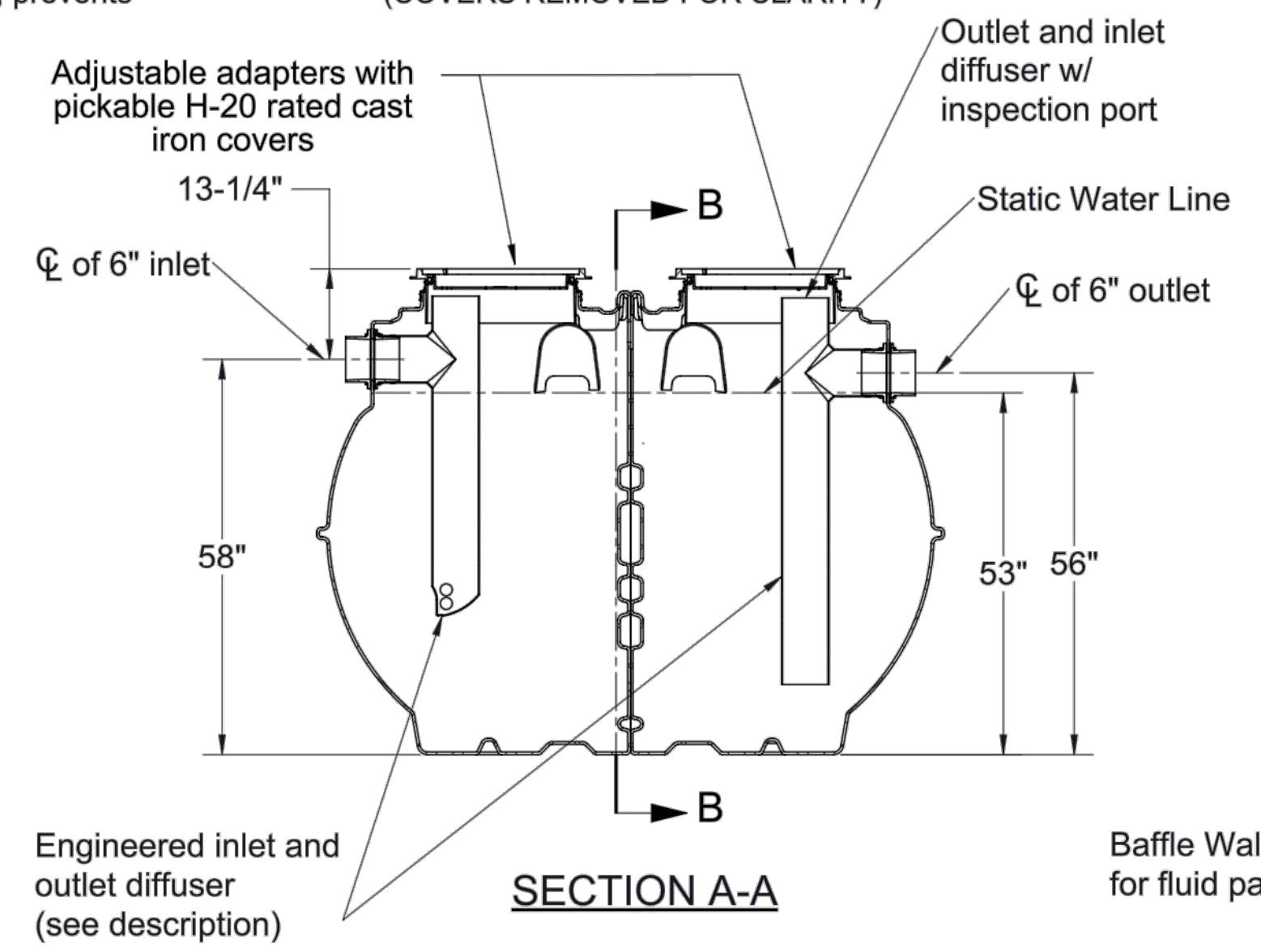
Satisfies Miami DERM 99% efficiency requirements. Product labels are permanently attached to inside and outside of unit for easy viewing.



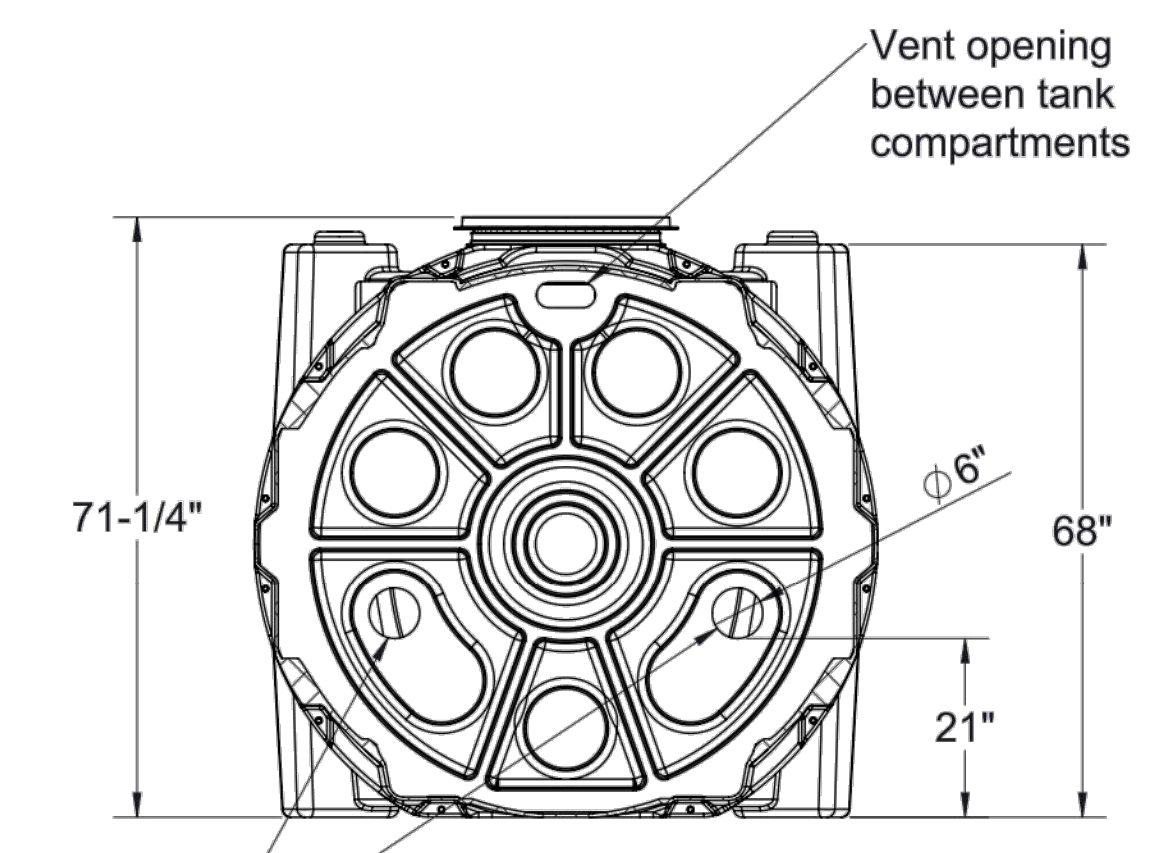
**TOP VIEW**  
(COVERS REMOVED FOR CLARITY)



**ISOMETRIC VIEW**



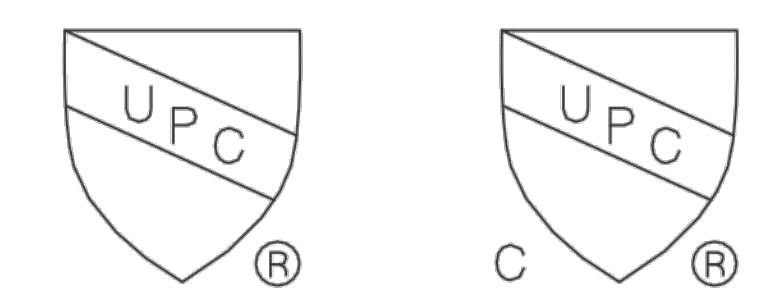
**SECTION A-A**



**SECTION B-B**

**SPECIFICATION SHEET**

<b>MODEL NUMBER:</b> <b>GB-1000</b>	<b>PART NUMBER:</b> 4080-002-01
<b>DESCRIPTION:</b> GB-1000 GREASE INTERCEPTOR 100 GPM/ 200 GPM 6" INLET/OUTLET, H-20 RATED CAST IRON COVER	
<small>PROPRIETARY AND CONFIDENTIAL</small>	
<small>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SCHIER PRODUCTS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SCHIER PRODUCTS IS PROHIBITED.</small>	
<b>DWG BY:</b> B.BROWN	<b>DATE:</b> 10/18/2021
<b>REV:</b> 02	<b>ECO:</b> 032822TA



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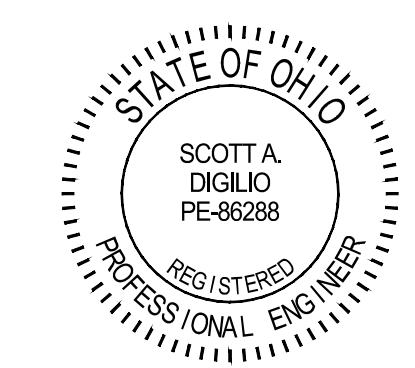
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**UTILITY DETAILS**

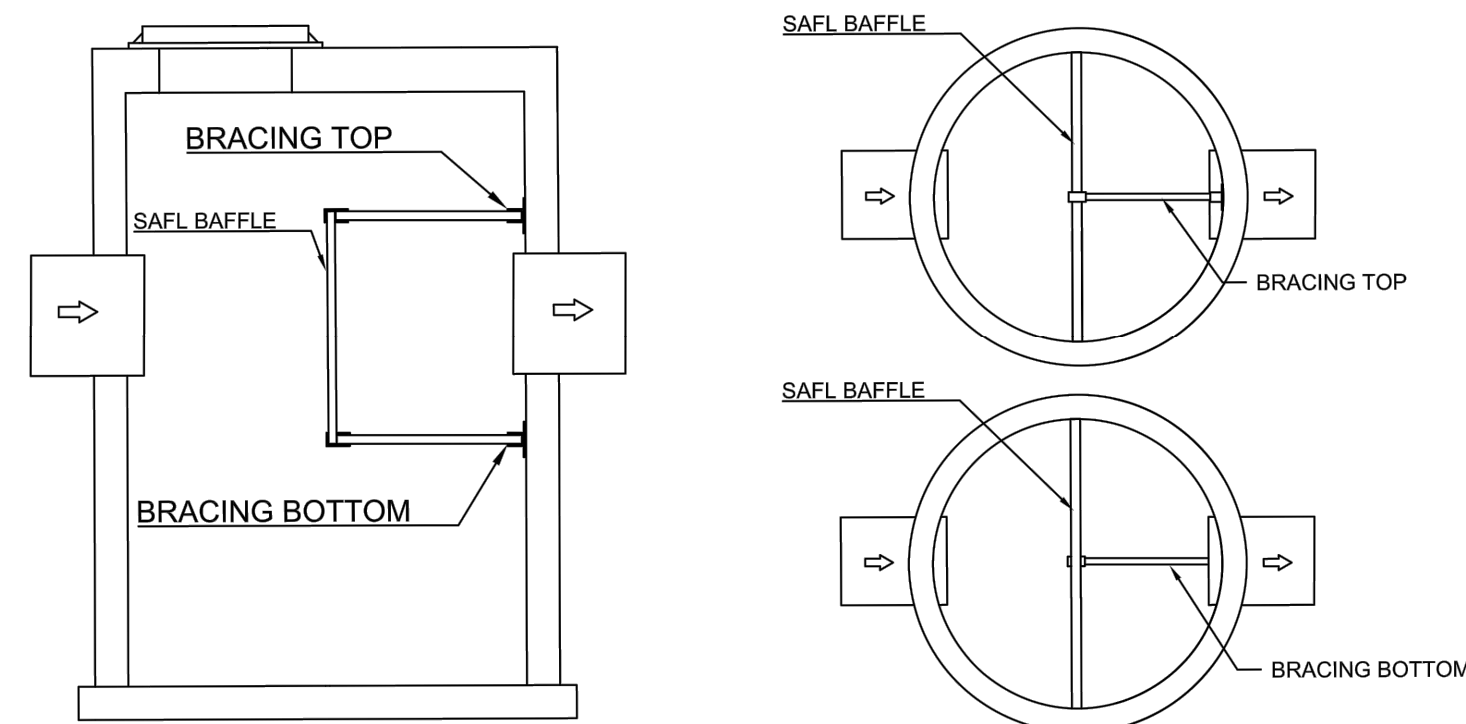
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### SAFL BAFFLE BRACING REQUIREMENTS

Rev A.2 (05-09-2023)



SIDE VIEW

TOP VIEW

#### Guidance for Cross Bracing - SAFL Baffle

Pipe Inside Diameter (inches)	Bracing Needed Above This Flow (CFS)	Max Flow with 2 Braces (1 top, bottom)	Max Flow with 4 Braces (2 top, 2 bottom)
24	20	30	40
30	30	45	60
36	40	60	75
42	55	70	90
48	75	105	130
60	110	160	200

Note: Flows shown are maximum design flows with a slope of less than 3%. Contact Upstream Technologies if pipe slopes are 3% or greater.

Also see: [Stacking Guide & Sizing Guide](#)

PATENT PROTECTED Patents: US #8663466B2 - US #8715507B2 - US #9506237B2 - CA #2742207

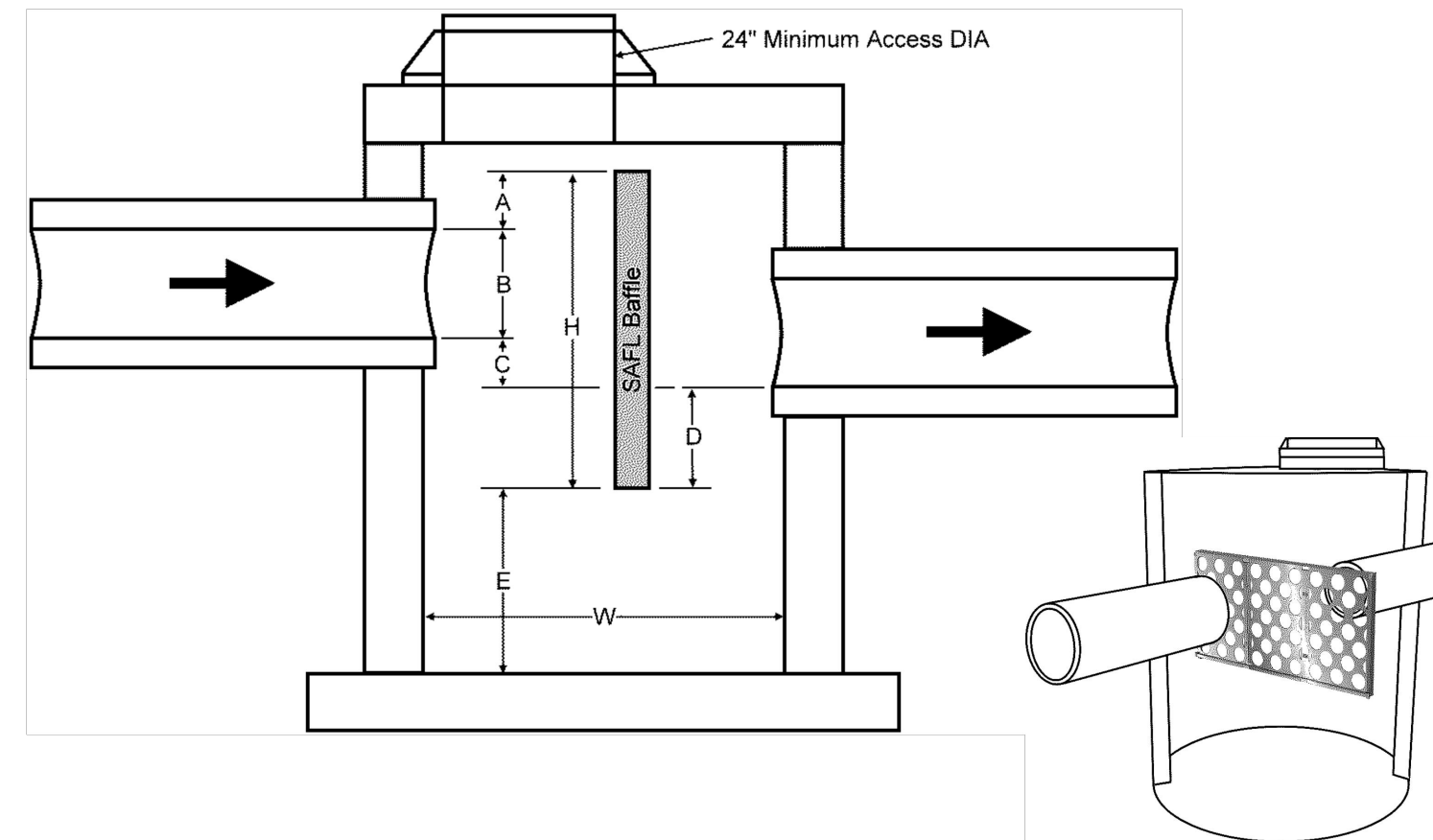
This generic detail does not encompass the sizing, fit, and applicability of the SAFL Baffle for this specific project. It is the ultimate responsibility of the design engineer to assure that the design is in compliance with all applicable laws and regulations. The SAFL Baffle is a patented technology of Upstream Technologies, Inc. Upstream Technologies does not approve plans, sizing, or system designs.

**SAFL BAFFLE BRACING DETAIL**  
UPSTREAM TECHNOLOGIES INC.  
5201 EAST RIVER ROAD, SUITE 303  
FRIDLEY, MN 55421  
651-237-5123



### SAFL BAFFLE SIZING REQUIREMENTS

Rev A.2 (05-09-2023)



A	0 to 6" 6" is ideal
B	Inlet pipe inside diameter
C	0 to 6" 0" is ideal
D	12"
E	36" Minimum. 48" or greater is ideal and results in less frequent sump cleanout
W	W = Sump diameter if round or width if rectangular
H	Baffle height = A + B + C + D
Purchase Baffle Size	W x H View the complete list of <a href="#">Available Baffle Sizes</a>
	Also see: <a href="#">Bracing Guide &amp; Stacking Guide</a>
NOTE 1	If H is greater than 57" two SAFL Baffles may be stacked.
NOTE 2	75% of flow must be horizontal. No more than 25% falling from above
NOTE 3	This detail does not cover sizing the sump for sediment removal efficiency. Contact Upstream for sump sizing or use SHSAM Software
NOTE 4	For more information, see our <a href="#">Design Guide</a>

PATENT PROTECTED Patents: US #8663466B2 - US #8715507B2 - US #9506237B2 - CA #2742207

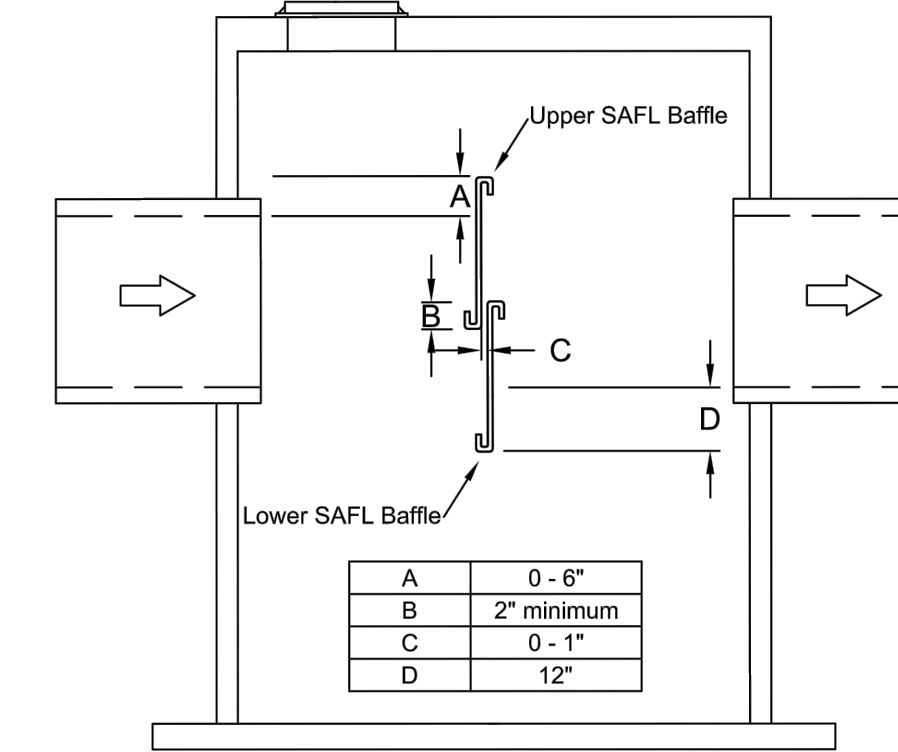
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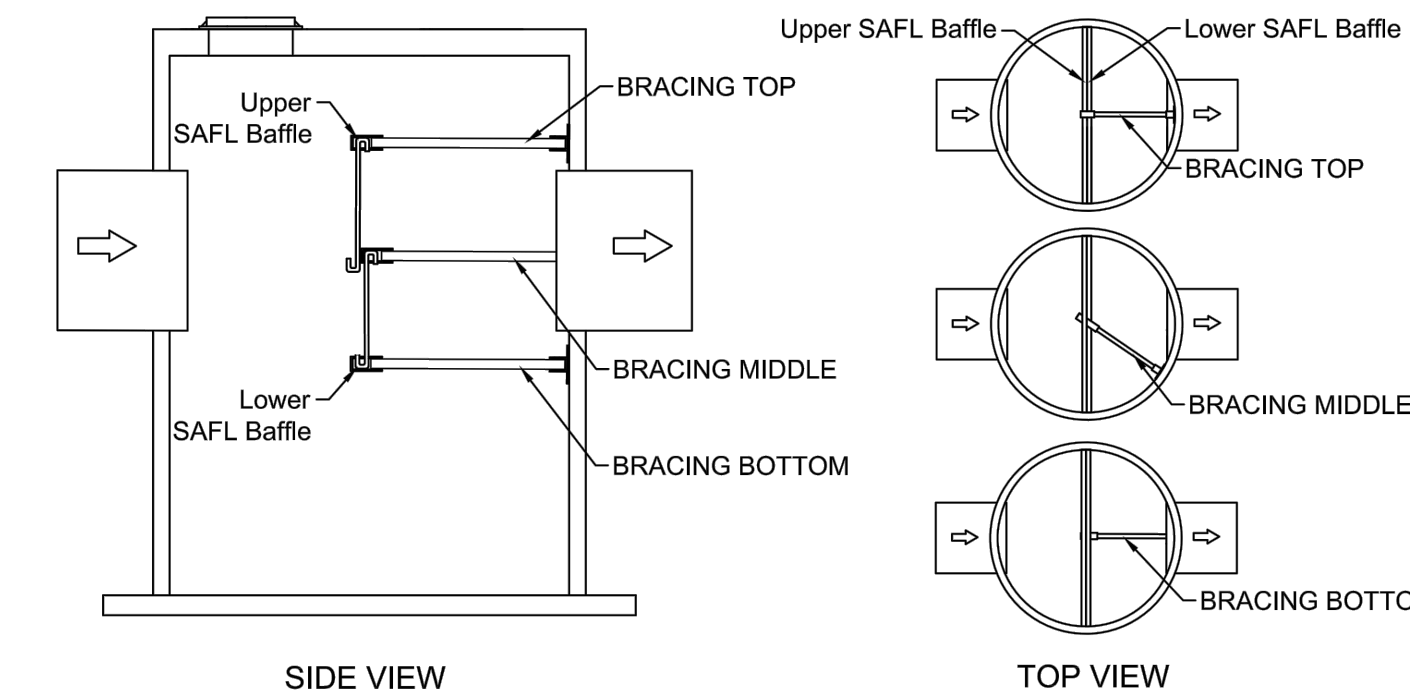
### SAFL BAFFLE STACKING REQUIREMENTS

Rev A.2 (05-09-2023)



A	0 - 6"
B	2" minimum
C	0 - 1"
D	12"

#### Bracing for Stacked Baffles



SIDE VIEW

TOP VIEW

Also see: [Bracing Guide & Sizing Guide](#)

PATENT PROTECTED Patents: US #8663466B2 - US #8715507B2 - US #9506237B2 - CA #2742207

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PANDA EXPRESS, INC.  
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91770  
Telephone: 626.799.9898  
Facsimile: 626.372.8288

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#### REVISIONS:

NO.	DESCRIPTION	DATE

#### ISSUE DATE:

PLANNING	01-28-25
PLANNING	03-13-25

DRAWN BY: rtm

PANDA PROJECT #: D36943

PANDA STORE #: -

ARCH PROJECT #: 24120



**Heights Venture**  
ARCHITECTURE • DESIGN

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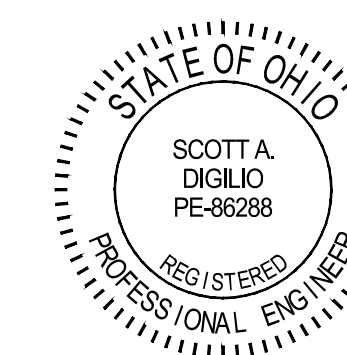
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281.854.6100

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PANDA HOME R4  
32429 COOK RD

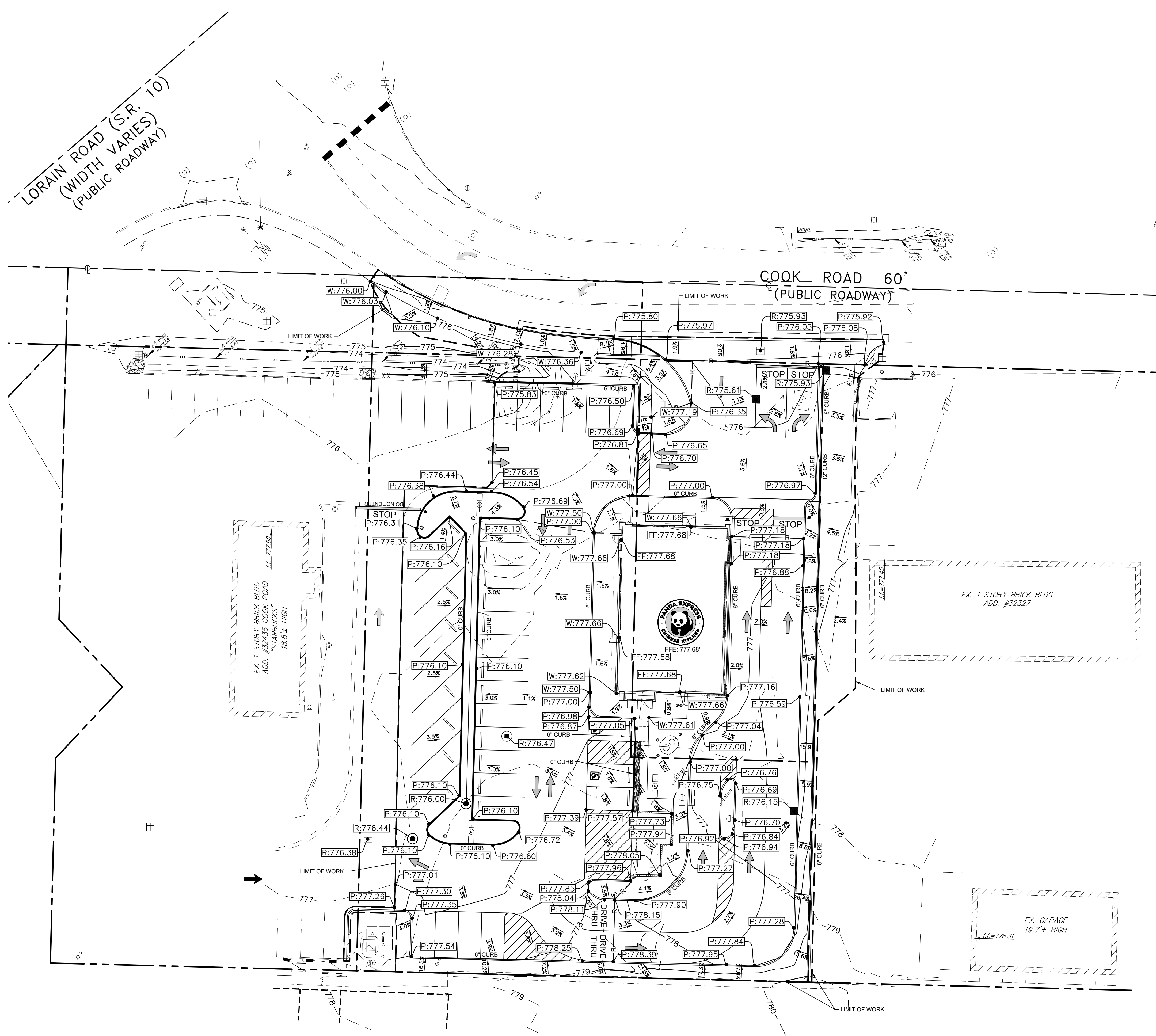
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UTILITY DETAILS

C04.4



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GRADING LEGEND		
DESCRIPTION	EXISTING	PROPOSED
SPOT ELEVATION	XXX.XX	P:XX.XX
CONTOUR LINE	-600-	-600-
FLOW ARROW	1.21%	1.21%
STORM CATCHBASIN OR INLET	[Symbol]	[Symbol]

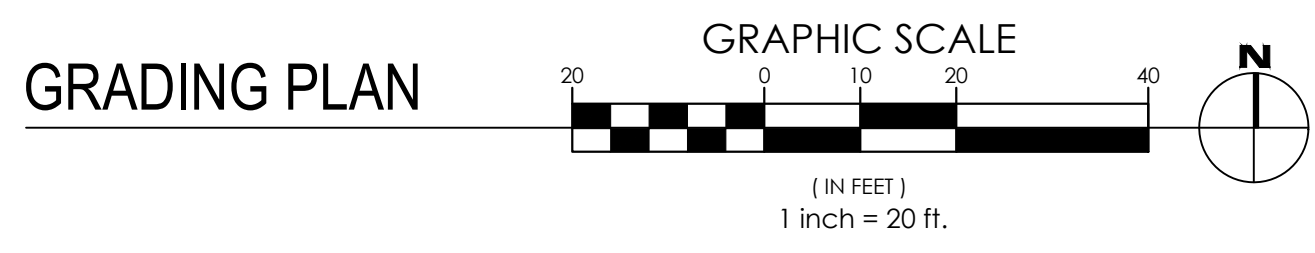
- FF:XXX.XX OR FFE XXX.XX FINISHED FLOOR
- FL:XXX.XX FLOWLINE
- G:XXX.XX TOP OF GROUND
- P:XXX.XX PAVEMENT
- R:XXX.XX RIM
- W:XXX.XX TOP OF WALK
- TC:XXX.XX TOP OF CURB

**GRADING NOTES**

- ALL GRADES SHOWN ARE TO FLOWLINE UNLESS OTHERWISE NOTED.
- PROPOSED ELEVATIONS SHOWN ON PROPOSED CURB LINES ARE FLOW LINE ELEVATIONS UNLESS NOTED OTHERWISE. ADD 0.50' TO OBTAIN TOP OF CURB ELEVATIONS.
- CONTRACTOR SHALL FIELD VERIFY GRADES IN THE LOCATIONS INDICATED AT THE TIME OF CONSTRUCTION. CARE SHALL BE TAKEN TO MATCH EXISTING GRADES AT PROPERTY LINE TO ENSURE A SMOOTH TRANSITION BETWEEN PROPOSED ASPHALT PAVEMENT AND ADJACENT PROPERTY.

**HYDROLOGY STATEMENT**

ONSITE STORMWATER RUN-OFF WILL SURFACE FLOW TO A BIORETENTION AREAS AND INLETS THAT LEAD TO AN UNDERGROUND PIPE SYSTEM.



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PLANNING	03-13-25
PLANNING	07-07-25

DRAWN BY:

rtm

PANDA PROJECT #: D36943  
PANDA STORE #: -  
ARCH PROJECT #: 24120



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ARCHITECTURE • DESIGN

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CHICAGO  
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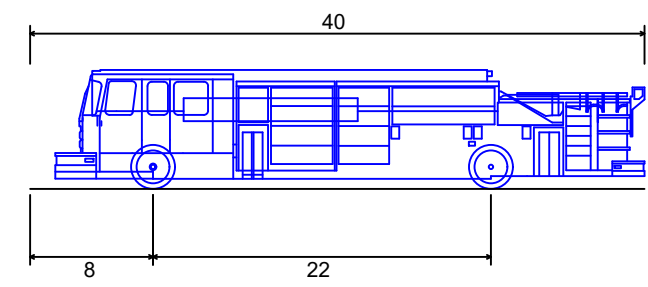
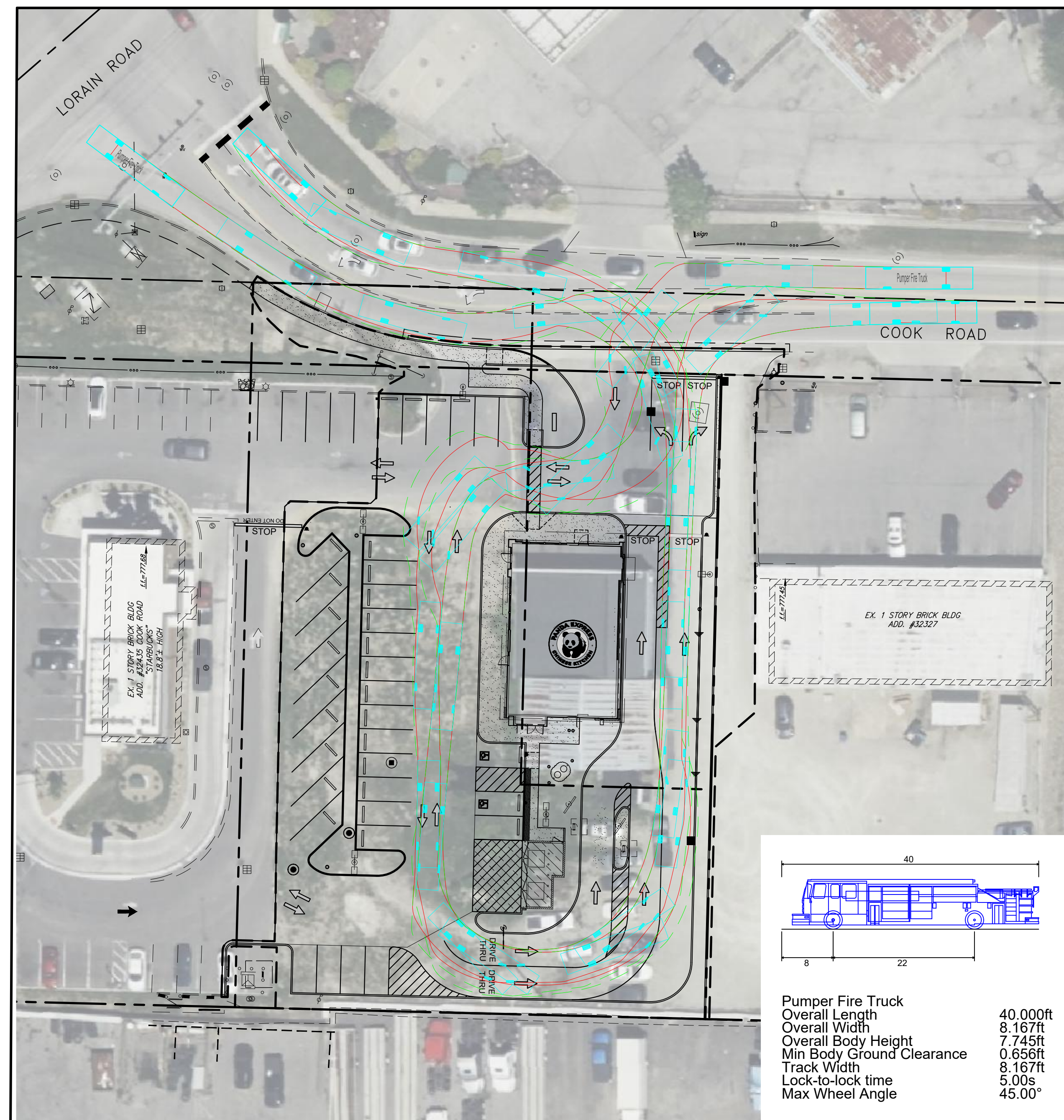
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GRADING PLAN

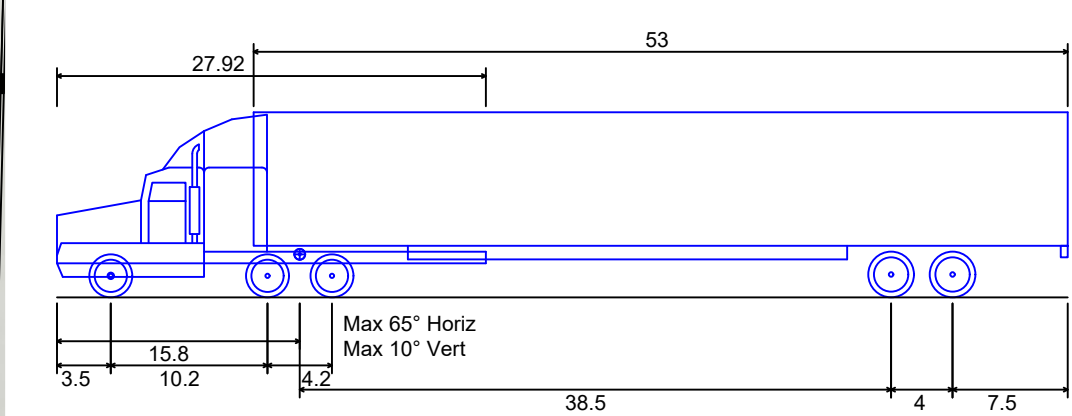
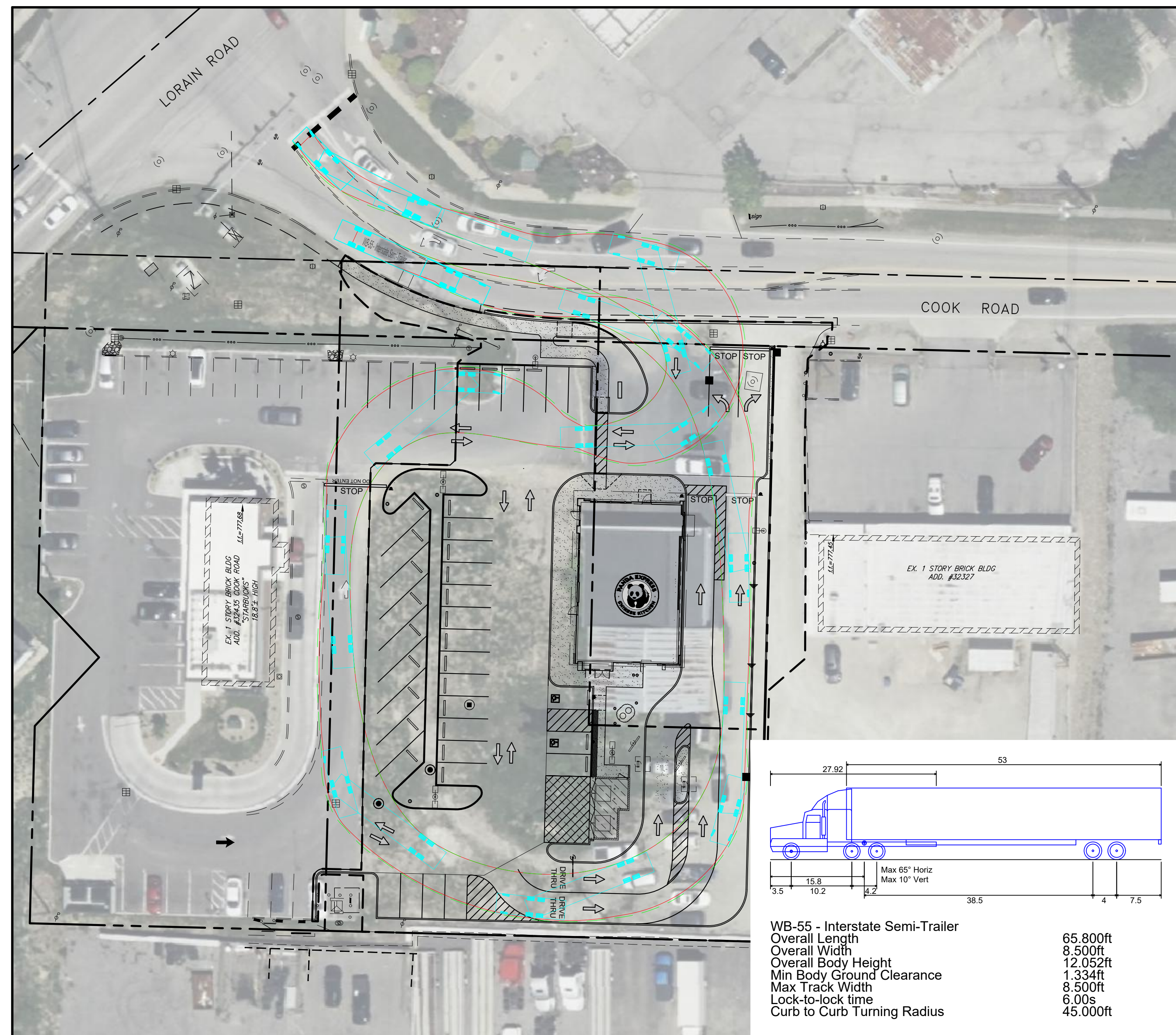
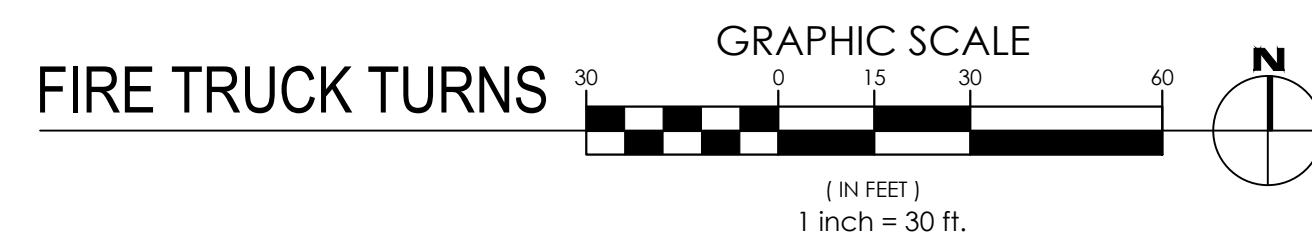
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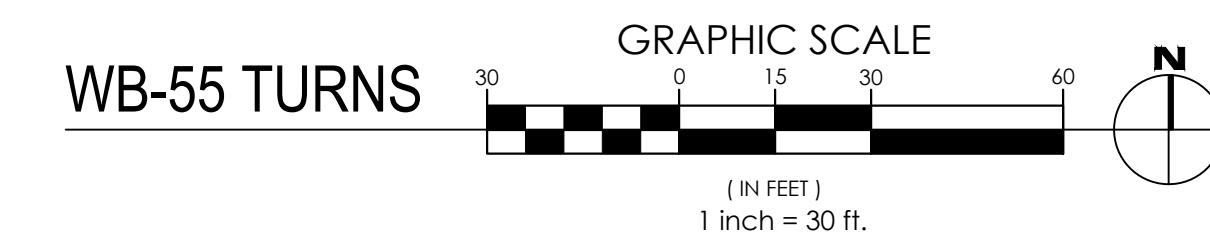
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**Pumper Fire Truck**  
 Overall Length 40.00ft  
 Overall Width 8.167ft  
 Overall Body Height 7.745ft  
 Min Body Ground Clearance 0.656ft  
 Track Width 8.167ft  
 Lock-to-lock time 5.00s  
 Max Wheel Angle 45.00°



**WB-55 - Interstate Semi-Trailer**  
 Overall Length 65.800ft  
 Overall Width 8.500ft  
 Overall Body Height 12.052ft  
 Min Body Ground Clearance 1.334ft  
 Max Track Width 8.500ft  
 Lock-to-lock time 6.00s  
 Curb to Curb Turning Radius 45.000ft



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DRAWN BY: rtm

PANDA PROJECT #: D36943  
 PANDA STORE #: -  
 ARCH PROJECT #: 24120



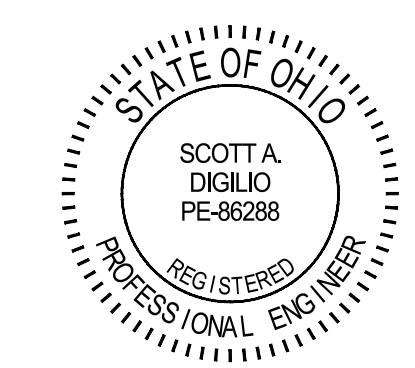
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 281.854.6100

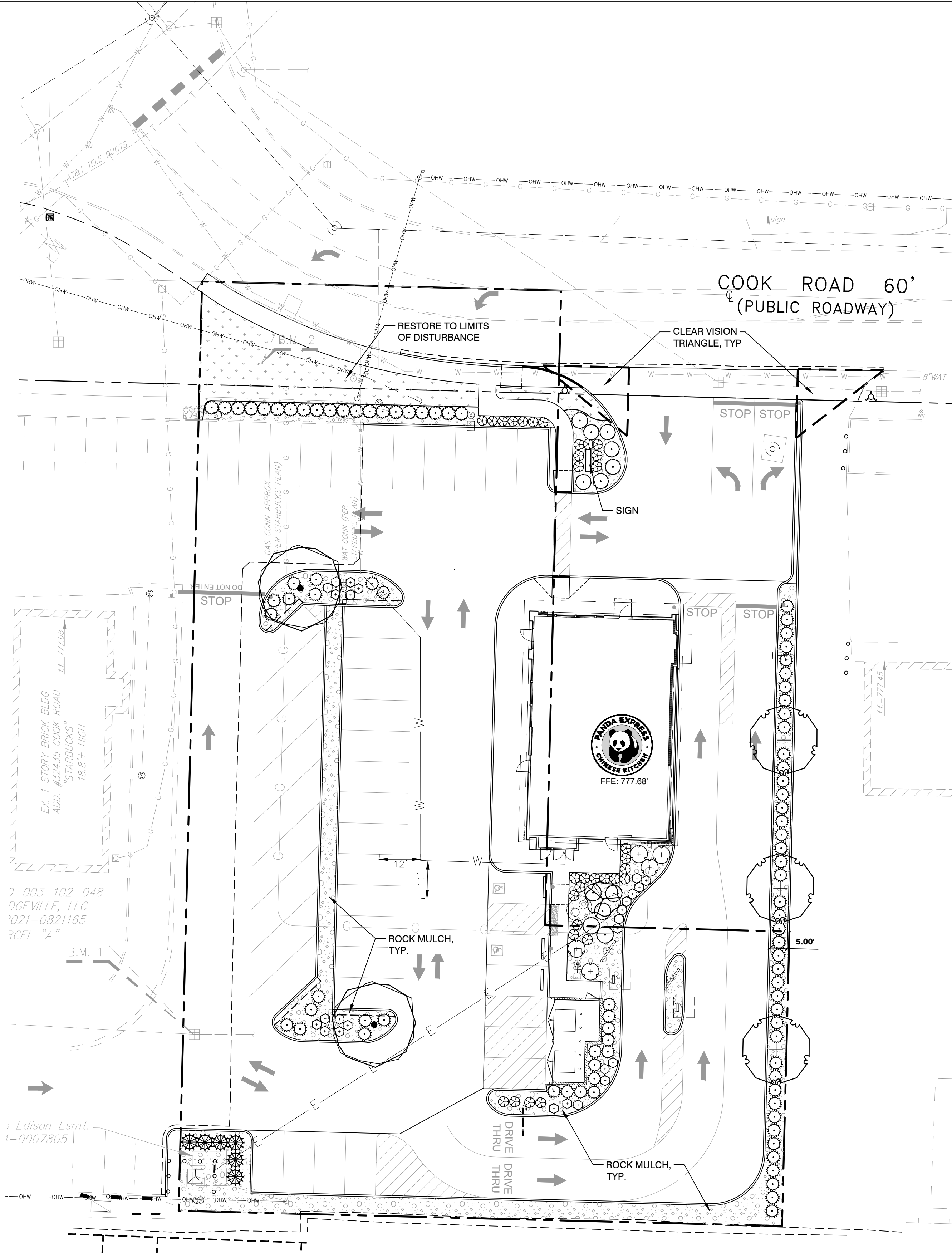
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 NORTH RIDGEVILLE, OH 44039

**TRUCK TURNING EXHIBIT**  
 X01.0





7-003-102-048  
 OCEVILLE, LLC  
 021-0821165  
 RCEL "A"

2 Edison Esmt.  
 1-0007805

PPN 07-00-003-102-028,  
 027 & 010  
 HRITCU, STELIAN & LIVA M.  
 DOC. #2018-0663201

**PLANT SCHEDULE**

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT.	MIN. SIZE
<b>TREES</b>					
	AA	2	Acer x freemanii 'Jeffersred' Autumn Blaze® Freeman Maple	Cont. or F.G.	2" CAL
	CC	1	Cercis canadensis 'Covey' Lavender Twist® Eastern Redbud	B&B	2" CAL
	GP	3	Ginkgo biloba 'PNI 2720' Princeton Sentry® Maidenhair Tree	2" Cal.	B&B
	JS	6	Juniperus chinensis 'Spartan' Spartan Juniper	Cont. or F.G.	6' HT

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT.	MIN. SIZE	SPACING
<b>SHRUBS</b>						
	BM	5	Buddleja x 'Miss Molly' Miss Molly Butterfly Bush	5 gal.	24" HT	60" o.c.
	IG	70	Ilex glabra 'Shamrock' Inkberry	3 gal.	18" HT	48" o.c.
	JB	12	Juniperus horizontalis 'Blue Chip' Blue Chip Juniper	5 gal.	24" SPD	60" o.c.
	SG	26	Spiraea japonica 'Goldmound' Goldmound Japanese Spirea	3 gal.	18" HT	36" o.c.
	SL	32	Spiraea japonica 'Little Princess' Little Princess Japanese Spirea	3 gal.	18" HT	36" o.c.
	TM	20	Taxus x media 'Densiformis' Dense Yew	5 gal.	24" HT	48" o.c.

SYMBOL	CODE	BOTANICAL / COMMON NAME	CONT.	MIN. SIZE
<b>GROUND COVERS</b>				
	TURF	Poa pratensis Kentucky Bluegrass	sod	
<b>ROCK / STONE</b>				
	RR	1-1/2" River Rock River Rock mulch		4" depth

**LANDSCAPE CALCULATIONS**

ZONING:	B3 - HIGHWAY COMMERCIAL
FRONT YARD LANDSCAPING 10' MIN. PLANTING STRIP	PROVIDED
PARKING LOT SCREENING IN FRONT YARD ROW OF SHRUBS PROVIDED AS REQUIRED	
COMMERCIAL DISTRICT LANDSCAPING TREES: 1 PER 50 LF OF BUILDING TREES REQUIRED: 226/50= TREES PROVIDED:	5 TREES 5 TREES

**MULCHES**

AFTER ALL PLANTING IS COMPLETE, CONTRACTOR SHALL INSTALL 4" THICK LAYER OF RIVER COBBLE, 1"-2" DIA., OVER LANDSCAPE FABRIC (ANY APPROVED) IN ALL PLANTING AREAS (EXCEPT FOR TURF AND SEEDING AREAS). CONTRACTOR SHALL SUBMIT SAMPLES OF ALL MULCHES TO LANDSCAPE ARCHITECT AND OWNER FOR APPROVAL PRIOR TO CONSTRUCTION. ABSOLUTELY NO EXPOSED GROUND SHALL BE LEFT SHOWING ANYWHERE ON THE PROJECT AFTER MULCH HAS BEEN INSTALLED (SUBJECT TO THE CONDITIONS AND REQUIREMENTS OF THE "GENERAL GRADING AND PLANTING NOTES" AND SPECIFICATIONS).

**GENERAL GRADING AND PLANTING NOTES**

- BY SUBMITTING A PROPOSAL FOR THE LANDSCAPE PLANTING SCOPE OF WORK, THE CONTRACTOR CONFIRMS THAT HE HAS READ, AND WILL COMPLY WITH, THE ASSOCIATED NOTES, SPECIFICATIONS, AND DETAILS WITH THIS PROJECT.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL EXISTING VEGETATION (EXCEPT WHERE NOTED TO REMAIN).
- IN THE CONTEXT OF THESE PLANS, NOTES, AND SPECIFICATIONS, "FINISH GRADE" REFERS TO THE FINAL ELEVATION OF THE SOIL SURFACE (NOT TOP OF MULCH) AS INDICATED ON THE GRADING PLANS.
  - BEFORE STARTING WORK, THE LANDSCAPE CONTRACTOR SHALL VERIFY THAT THE ROUGH GRADES OF ALL LANDSCAPE AREAS ARE WITHIN +/-0.1' OF FINISH GRADE. SEE SPECIFICATIONS FOR MORE DETAILED INSTRUCTION ON TURF AREA AND PLANTING BED PREPARATION.
  - CONSTRUCT AND MAINTAIN FINISH GRADES AS SHOWN ON GRADING PLANS, AND CONSTRUCT AND MAINTAIN SLOPES AS RECOMMENDED BY THE GEOTECHNICAL REPORT. ALL LANDSCAPE AREAS SHALL HAVE POSITIVE DRAINAGE AWAY FROM STRUCTURES AT THE MINIMUM SLOPE SPECIFIED IN THE REPORT AND ON THE GRADING PLANS, AND AREAS OF POTENTIAL PONDING SHALL BE REGRADED TO BLEND IN WITH THE SURROUNDING GRADES AND ELIMINATE PONDING POTENTIAL. THE LANDSCAPE CONTRACTOR SHALL DETERMINE WHETHER OR NOT THE EXPORT OF ANY SOIL WILL BE NEEDED, TAKING INTO ACCOUNT THE ROUGH GRADE PROVIDED, THE AMOUNT OF SOIL AMENDMENTS TO BE ADDED (BASED ON A SOIL TEST, PER SPECIFICATIONS), AND THE FINISH GRADES TO BE ESTABLISHED. ENSURE THAT THE FINISH GRADE IN SHRUB AREAS IMMEDIATELY ADJACENT TO WALKS AND OTHER WALKING SURFACES, AFTER INSTALLING SOIL AMENDMENTS, IS 3" BELOW THE ADJACENT FINISH SURFACE, IN ORDER TO ALLOW FOR PROPER MULCH DEPTH. TAPER THE SOIL SURFACE TO MEET FINISH GRADE, AS SPECIFIED ON THE GRADING PLANS, AT APPROXIMATELY 18" AWAY FROM THE WALKS.
  - ENSURE THAT THE FINISH GRADE IN TURF AREAS IMMEDIATELY ADJACENT TO WALKS AND OTHER WALKING SURFACES, AFTER INSTALLING SOIL AMENDMENTS, IS 1" BELOW THE FINISH SURFACE OF THE WALKS. TAPER THE SOIL SURFACE TO MEET FINISH GRADE, AS SPECIFIED ON THE GRADING PLANS, AT APPROXIMATELY 18" AWAY FROM THE WALKS.
  - SHOULD ANY CONFLICTS AND/OR DISCREPANCIES ARISE BETWEEN THE GRADING PLANS, GEOTECHNICAL REPORT, THESE NOTES AND PLANS, AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY BRING SUCH ITEMS TO THE ATTENTION OF THE LANDSCAPE ARCHITECT, GENERAL CONTRACTOR, AND OWNER.
- ALL PLANT LOCATIONS ARE DIAGRAMMATIC. ACTUAL LOCATIONS SHALL BE VERIFIED WITH THE LANDSCAPE ARCHITECT OR DESIGNER PRIOR TO PLANTING. THE LANDSCAPE CONTRACTOR SHALL ENSURE THAT ALL REQUIREMENTS OF THE PERMITTING AUTHORITY ARE MET (I.E., MINIMUM PLANT QUANTITIES, PLANTING METHODS, TREE PROTECTION METHODS, ETC.).
  - THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR DETERMINING PLANT QUANTITIES. PLANT QUANTITIES SHOWN ON LEGENDS AND CALLOUTS ARE FOR GENERAL INFORMATION ONLY. IN THE EVENT OF A DISCREPANCY BETWEEN THE PLAN AND THE PLANT LEGEND, THE PLANT QUANTITY AS SHOWN ON THE PLAN (FOR INDIVIDUAL SYMBOLS) OR CALLOUT (FOR GROUNDCOVER PATTERNS) SHALL TAKE PRECEDENCE.
  - NO SUBSTITUTIONS OF PLANT MATERIALS SHALL BE ALLOWED WITHOUT THE WRITTEN PERMISSION OF THE LANDSCAPE ARCHITECT AND TOWNSHIP LANDSCAPE ARCHITECT. IF SOME OF THE PLANTS ARE NOT AVAILABLE, THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT IN WRITING (VIA PROPER CHANNELS).
  - THE CONTRACTOR SHALL, AT A MINIMUM, PROVIDE REPRESENTATIVE PHOTOS OF ALL PLANTS PROPOSED FOR THE PROJECT. THE CONTRACTOR SHALL ALLOW THE LANDSCAPE ARCHITECT AND THE OWNER/OWNER'S REPRESENTATIVE TO INSPECT, AND APPROVE OR REJECT, ALL PLANTS DELIVERED TO THE JOBSITE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR SUBMITTALS.
- THE CONTRACTOR SHALL MAINTAIN THE LANDSCAPE IN A HEALTHY CONDITION FOR 90 DAYS AFTER ACCEPTANCE BY THE OWNER. REFER TO SPECIFICATIONS FOR CONDITIONS OF ACCEPTANCE FOR THE START OF THE MAINTENANCE PERIOD, AND FOR FINAL ACCEPTANCE AT THE END OF THE MAINTENANCE PERIOD.
- SEE SPECIFICATIONS AND DETAILS FOR FURTHER REQUIREMENTS.

**IRRIGATION CONCEPT**

- AN AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED AND OPERATIONAL BY THE TIME OF FINAL INSPECTION. THE ENTIRE IRRIGATION SYSTEM SHALL BE INSTALLED BY A LICENSED AND QUALIFIED IRRIGATION CONTRACTOR.
- THE IRRIGATION SYSTEM WILL OPERATE ON POTABLE WATER, AND THE SYSTEM WILL HAVE APPROPRIATE BACKFLOW PREVENTION DEVICES INSTALLED TO PREVENT CONTAMINATION OF THE POTABLE SOURCE.
- ALL NON-TURF PLANTED AREAS SHALL BE DRIP IRRIGATED. SODDED AND SEEDING AREAS SHALL BE IRRIGATED WITH SPRAY OR ROTOR HEADS AT 100% HEAD-TO-HEAD COVERAGE.
- ALL PLANTS SHARING SIMILAR HYDROZONE CHARACTERISTICS SHALL BE PLACED ON A VALVE DEDICATED TO PROVIDE THE NECESSARY WATER REQUIREMENTS SPECIFIC TO THAT HYDROZONE.
- THE IRRIGATION SYSTEM SHALL BE DESIGNED AND INSTALLED, TO THE MAXIMUM EXTENT POSSIBLE, TO CONSERVE WATER BY USING THE FOLLOWING DEVICES AND SYSTEMS: MATCHED PRECIPITATION RATE TECHNOLOGY ON ROTOR AND SPRAY HEADS (WHEREVER POSSIBLE), RAIN SENSORS, AND MULTI-PROGRAM COMPUTERIZED IRRIGATION CONTROLLERS FEATURING SENSORY INPUT CAPABILITIES.

**ROOT BARRIERS**

THE CONTRACTOR SHALL INSTALL ROOT BARRIERS NEAR ALL NEWLY PLANTED TREES THAT ARE LOCATED WITHIN FIVE (5) FEET OF PAVING OR CURBS. ROOT BARRIERS SHALL BE "CENTURY" OR "DEEP-ROOT" 24" DEEP PANELS (OR EQUAL). BARRIERS SHALL BE LOCATED IMMEDIATELY ADJACENT TO HARDSCAPE. INSTALL PANELS PER MANUFACTURER'S RECOMMENDATIONS. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR USE ROOT BARRIERS OF A TYPE THAT COMPLETELY ENCIRCLE THE ROOTBALL.

PRELIMINARY  
 Sharon M Stachecki, PLA  
 OH Registration #2101578  
 Not for Regulatory Approval, Permitting, or Construction.  
 07-08-25

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**REVISIONS:**

NO.	DESCRIPTION	DATE

**ISSUE DATE:**

PLANNING SET	01-28-25
PLANNING SET 2	07-08-25

**DRAWN BY:**

PANDA PROJECT #: S8-26-D36943  
 PANDA STORE #: D36943  
 ARCH PROJECT #: 24120



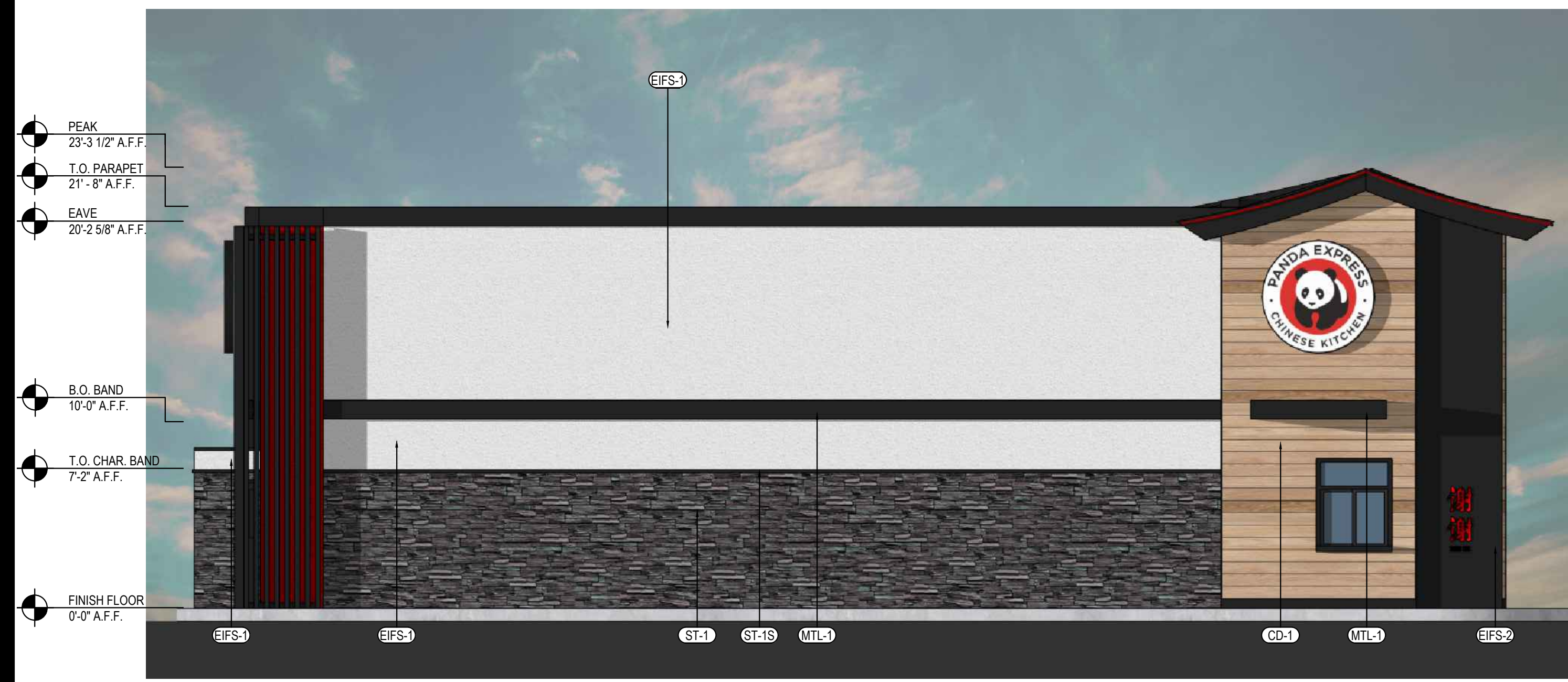
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 281.854.6100

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 32425 COOK ROAD  
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**L01.0**  
 LANDSCAPE PLAN







DRIVE THRU ELEVATION 5  
Scale= 3/16" = 1'-0" A-202



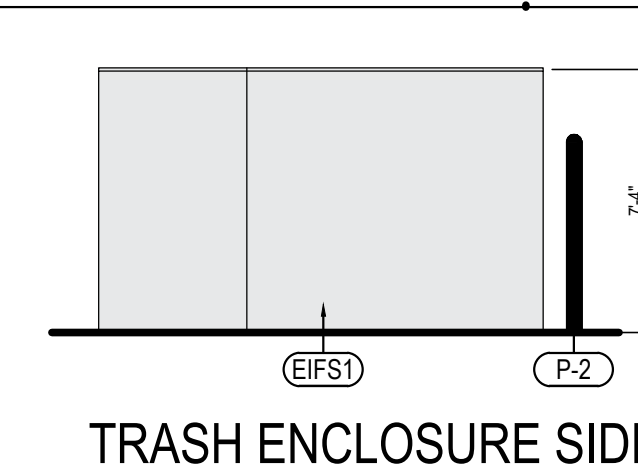
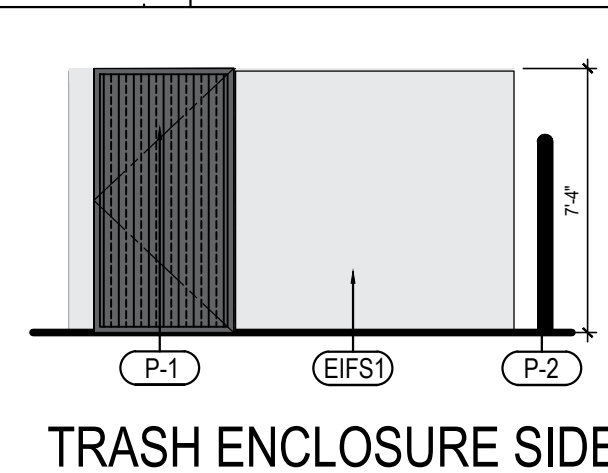
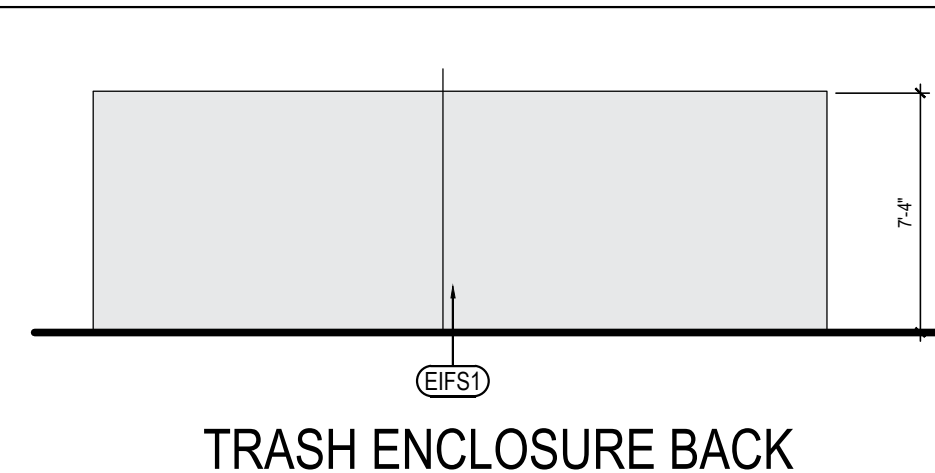
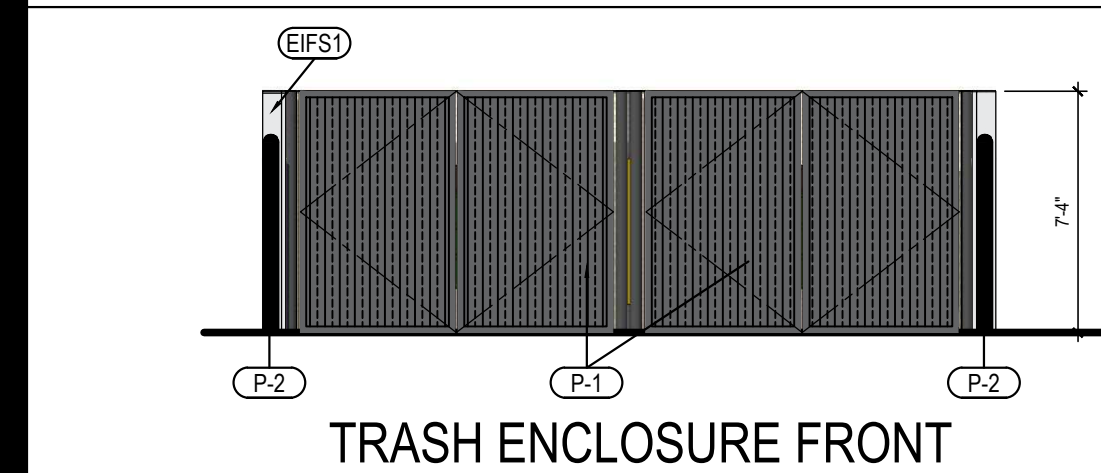
FRONT ELEVATION 3  
Scale= 3/16" = 1'-0" A-202



ENTRY ELEVATION 4  
Scale= 3/16" = 1'-0" A-202



REAR ELEVATION 2  
Scale= 3/16" = 1'-0" A-202



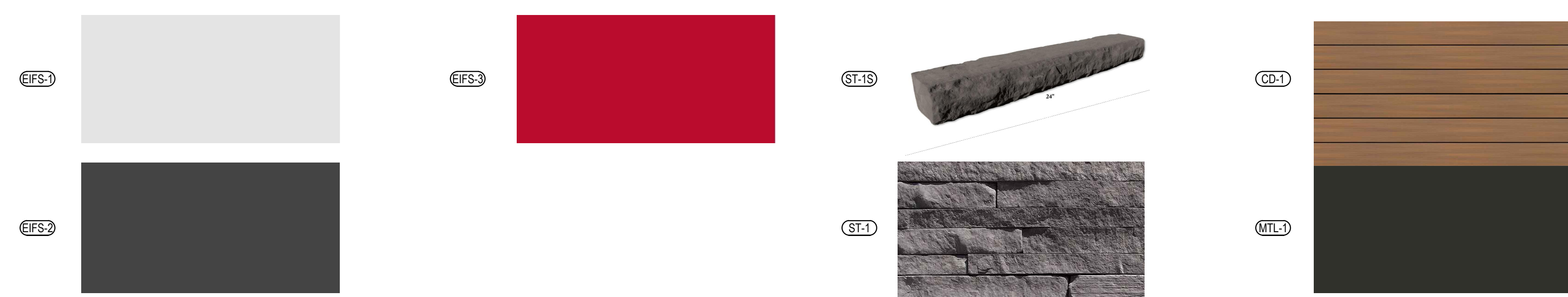
NO	MFG#	COLOR
(EIFS-1)	STOTHERM ESSENCE SYSTEM - EIFS	SW 7646 FIRST STAR
(P-1)	SW 7069 IRON ORE	
(P-2)	PAINT SAFETY YELLOW	

TRASH ENCLOSURE ELEVATIONS 1  
Scale= NTS A-202

EXTERIOR FINISH SCHEDULE

NO	MANUFACTURER	MFG#	COLOR	FINISH	NOTES
(EIFS-1)	STO	STOTHERM ESSENCE SYSTEM - EIFS	SW 7646 FIRST STAR	FINE	BUILDING BODY
(EIFS-2)	STO	STOTHERM ESSENCE SYSTEM - EIFS	SW7069 IRON ORE	FINE	EIFS ACCENT BAND
(EIFS-3)	STO	STOTHERM ESSENCE SYSTEM - EIFS	PANTONE COLOR 200C-RED	-FINE	EIFS BEHIND TRELIS
(ST-1S)	CORONADO STONE PRODUCTS	CHISELED STONE SILL	CHARCOAL	-	STONE CAP (3/8" VERTICAL JOINT - MORTAR TO MATCH STONE CAP)
(ST-1)	CORONADO STONE PRODUCTS	STRIP STONE	BLACKFOREST	-	WAINSCOT CONTACT: 864-962-1221 PROVIDE 3/8" MORTAR JOINTS MFG: ARGOS, COLOR: CHARCOAL
(CD-1)	FIBERON	WILDWOOD	BAMBOO	-	COMPOSITE CLADDING - CONTACT: MARIA SCHOLLER 419.704.5924 EMAIL: maria.scholler@fiberoncladding.com
(MTL-2)	PANDA VENDOR	ALLEN INDUSTRIES	PMS BLACK-7C	SATIN FINISH	CANOPY WITH LED WITH DOWN LIGHT AROUND BUILDING
(MTL-1)	EXCEPTIONAL METALS	-	"PANDA EXPRESS SW 7069IRON ORE"	-	CAP FLASHING

MATERIALS



PANDA EXPRESS, INC.  
1683 Walnut Grove Ave.  
Rosemead, California  
91770  
Telephone: 626.799.9898  
Facsimile: 626.372.8288

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REVISIONS:

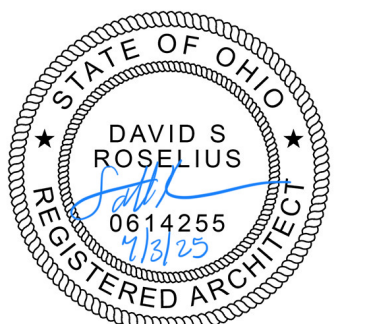
NO	DESCRIPTION	DATE

ISSUE DATE:

PLANNING SET	01-28-25
PLANNING SET 2	07-08-25

DRAWN BY:

PANDA PROJECT #: S8-26-D36943  
PANDA STORE #: D36943  
ARCH PROJECT #: 24120



Heights Venture  
ARCHITECTURE • DESIGN

HOUSTON  
1111 North Loop West, Suite 800  
Houston, Texas 77005  
281.854.6100

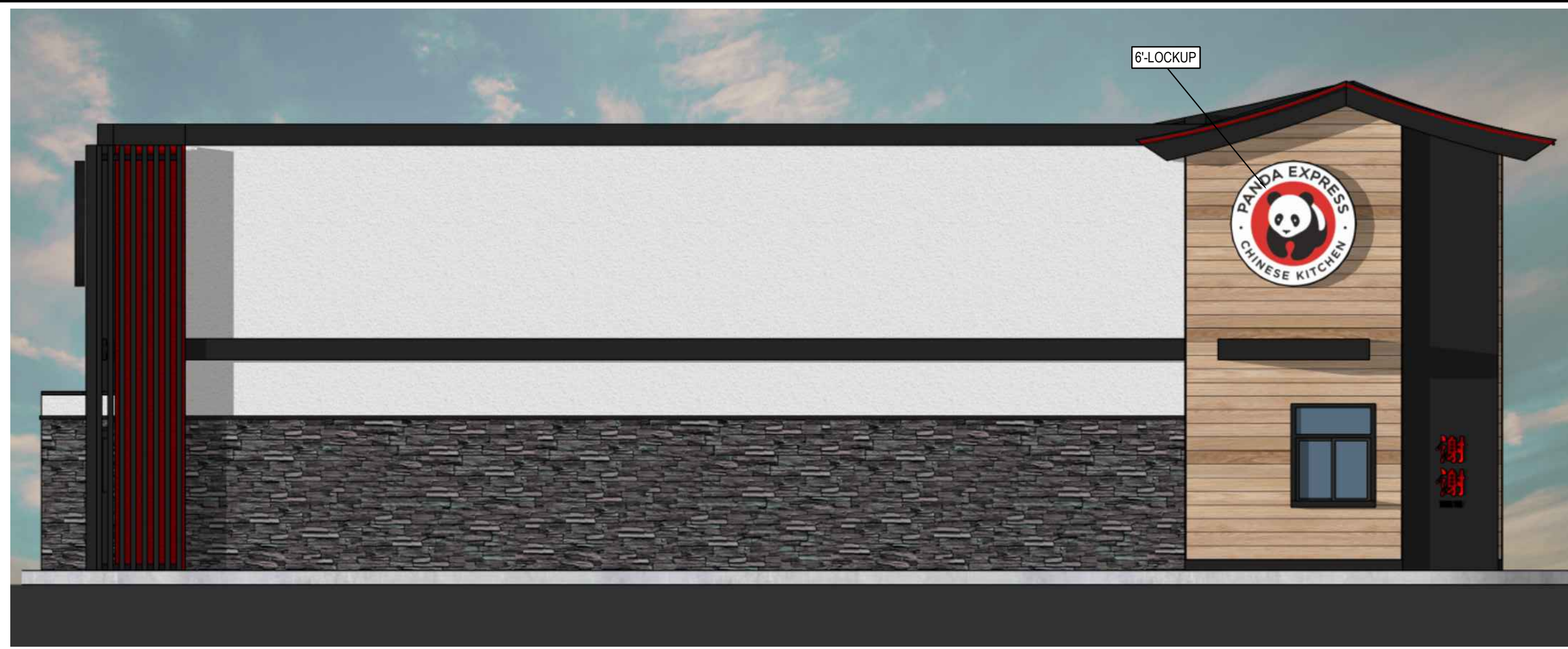
DALLAS  
5741 Legacy Drive, Suite 320  
Plano, Texas 75024  
281.854.6100

CHICAGO  
3333 Warrenville Road, Suite 200  
Lisle, Illinois 60532  
281.854.6100

PANDA EXPRESS  
PANDA HOME R3  
32425 COOK ROAD  
N. RIDGEVILLE, OH 44039

A-202

EXTERIOR  
COLOR ELEVATIONS



DRIVE THRU ELEVATION 6  
Scale= 3/16" - 10" A-203



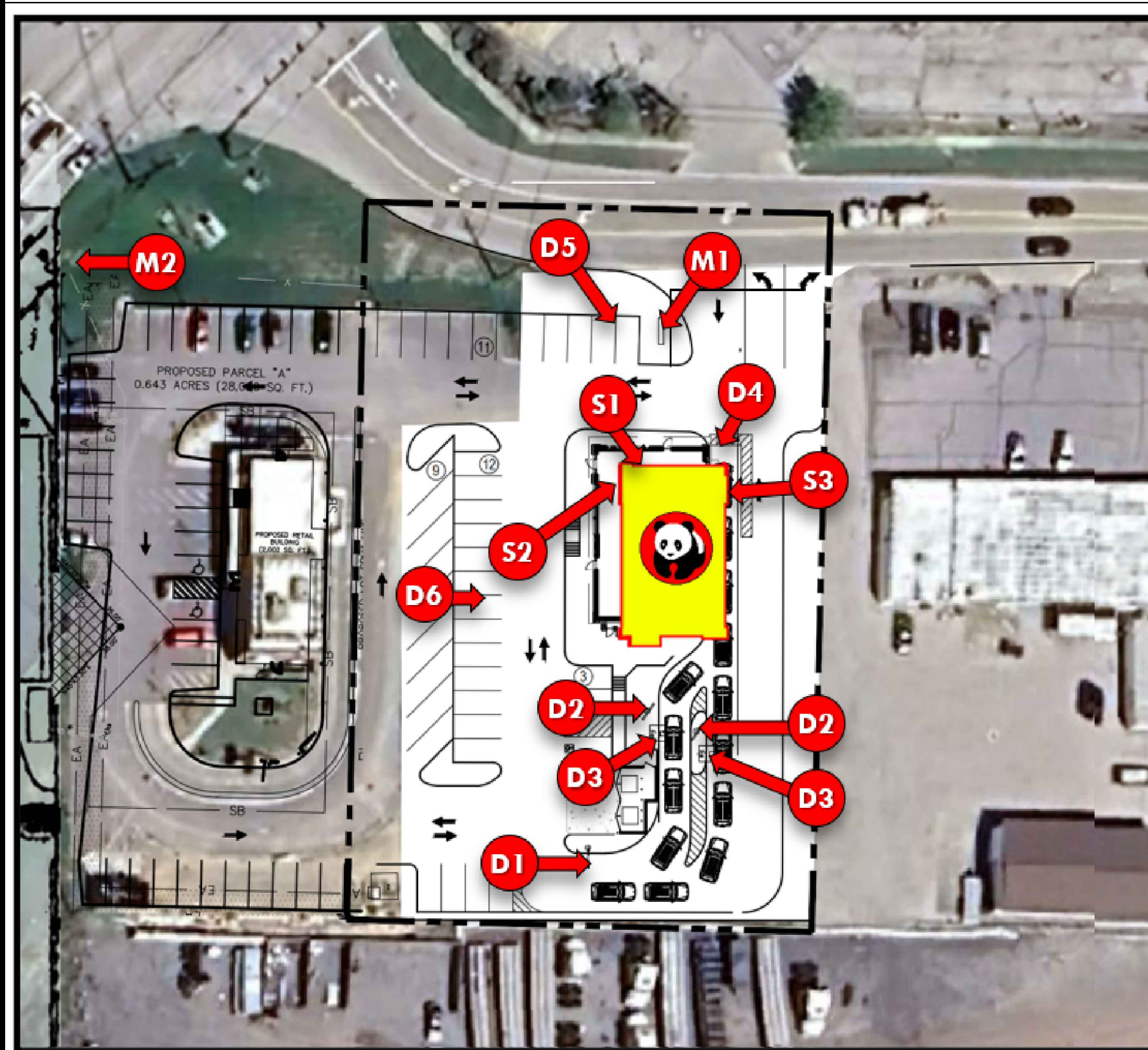
FRONT ELEVATION 3  
Scale= 3/16" - 10" A-203



ENTRY ELEVATION 5  
Scale= 3/16" - 10" A-203



PERSPECTIVE 2  
Scale= 3/16" - 10" A-203



KEY SIGNAGE ON SITE 4  
Scale= NTS A-203



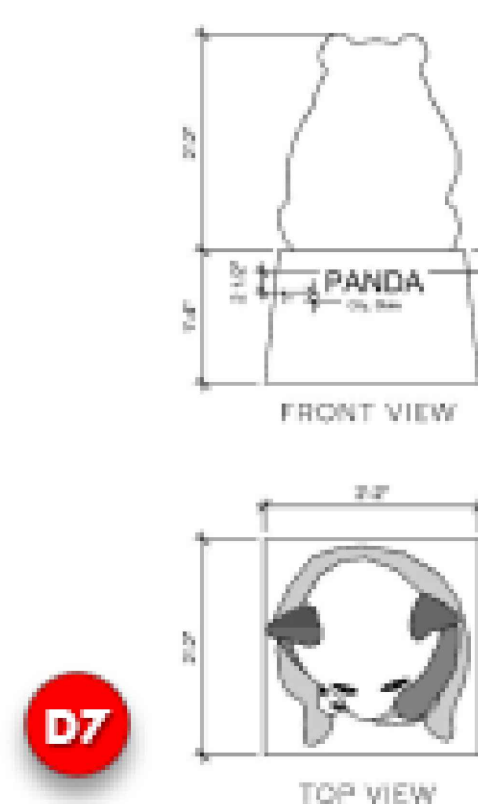
S1 2'-0" LETTERSET



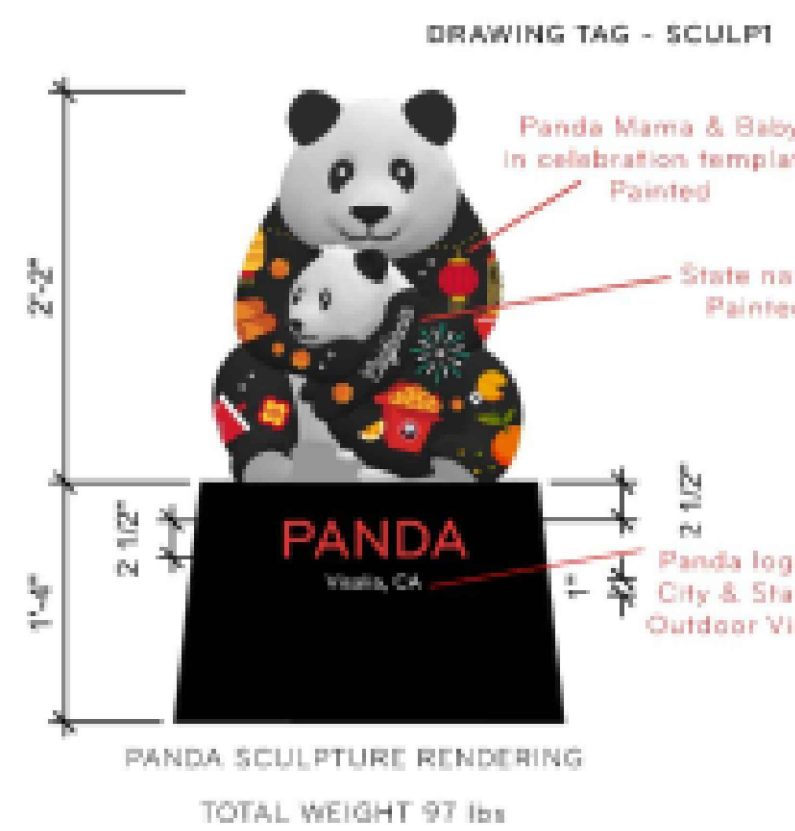
S2 S3 5'-0" LOCKUP



M1 10' TALL MONUMENT SIGN



D7



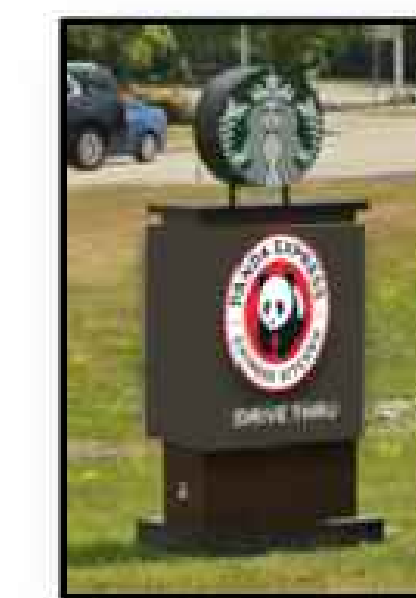
DRAWING TAG - SCULPT

PANDA SCULPTURE RENDERING

TOTAL WEIGHT 97 lbs



D1 D2 D3 D4 D5 D6 M2



PROPOSED MODIFICATION OF EXISTING MONUMENT (PENDING SB AND DEVELOPER APPROVAL)

PROPOSED SIGNAGE 1  
Scale= NTS A-203



PANDA EXPRESS, INC.  
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Rosemead, California  
91770  
Telephone: 626.799.9898  
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REVISIONS:

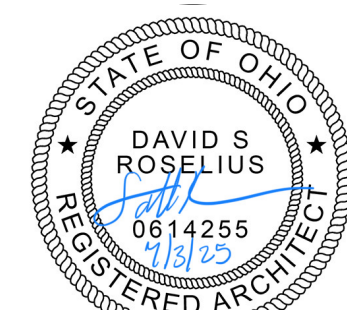
NO.	DESCRIPTION	DATE

ISSUE DATE:

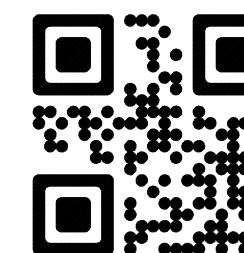
PLANNING SET	01-28-25
PLANNING SET 2	07-08-25

DRAWN BY:

PANDA PROJECT #: S8-26-D36943  
PANDA STORE #: D36943  
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**Heights Venture**  
ARCHITECTURE • DESIGN



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1111 North Loop West, Suite 800  
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PANDA HOME R3  
32425 COOK ROAD  
N. RIDGEVILLE, OH 44039

**A-203**

EXTERIOR COLOR ELEVATIONS  
PROPOSED SIGNAGE







## Slice Medium - SLM Outdoor LED Area Light



The Slice's sleek design makes it perfectly-suited for Commercial & Industrial applications, while its cost-effective die-cast aluminum housing makes its acquisition cost very competitive. The Slice offers high performance silicone optics, die cast aluminum housing, 42,000+ lumens and is available with integral Airlink Synapse controls.

### Features & Specifications

#### Optical System

- State-of-the-Art one piece silicone optic sheet delivers industry leading optical control with an integrated gasket to provide IP66 rated sealed optical chamber in 1 component.
- Proprietary silicone refractor optics provide exceptional coverage and uniformity in IES Types 2, 3, 5W, FT and FTA.
- Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 93%.
- Zero uplight.
- Available in 5000K, 4000K, 3000K, and 2700K color temperatures per ANSI C78.377. Also Available in Phosphor Converted Amber with Peak intensity at 610nm.
- Minimum CRI of 70.
- Integral Louver (IL) option available for improved back-light control without sacrificing street side performance. See page 5 for more details.

#### Electrical

- High-performance driver features over-voltage, under-voltage, short-circuit and over temperature protection.
- 0-10V dimming (10% - 100%) standard.
- Standard Universal Voltage (120-277 Vac) Input 50/60 Hz or optional High Voltage (347-480 Vac).
- L80 Calculated Life: >100k Hours (See Lumen Maintenance on Page 3)
- Total harmonic distortion: <20%
- Operating temperature: -40°C to +50°C (-40°F to +122°F). 42L lumen package rated to +40°C.
- Power factor: >.90
- Input power stays constant over life.
- Field replaceable surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Terminal block provided accepts up to 10ga wire.
- Components are fully encased in potting material for moisture resistance. Driver complies with FCC standards. Driver and key electronic components can easily be accessed.



Dimmable



WIRELESS CONTROLS

IP66



ROHS COMPLIANT

ARRA  
Funding Compliant

UL LISTED



MANUFACTURED IN USA



TITLE 24 COMPLIANT



IDA DARK SKY APPROVED

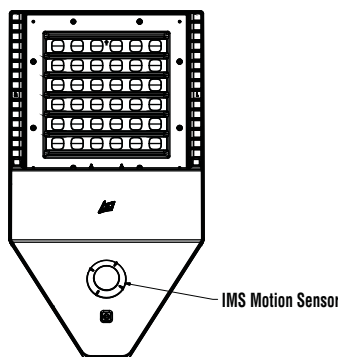
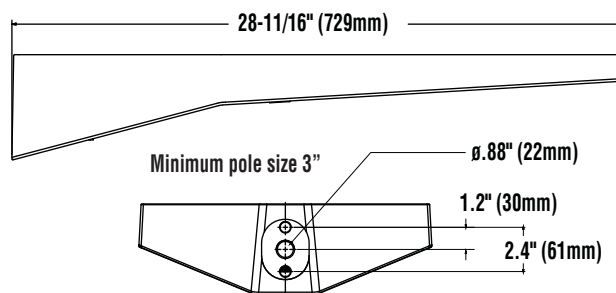
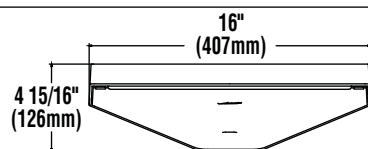


DLC LISTED PREMIUM

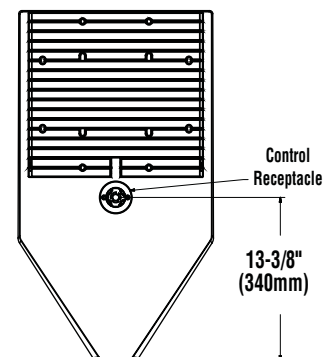


DLC LISTED PREMIUM

### Product Dimensions



Bottom View



Top View



# Slice Medium - SLM Outdoor LED Area Light

## Features & Specifications (Cont.)

### Construction

- Rugged die-cast aluminum housing contains factory prewired driver and optical unit. Cast aluminum wiring access door located underneath.
- Designed to mount to square poles.
- Luminaire is proudly manufactured in the U.S. of U.S. and imported parts.
- IP66 rated luminaire protects integral components from harsh environments.
- 3G rated for ANSI C136.31 high vibration applications
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
- Shipping weight: 30 lbs in carton.

### Controls

#### Wireless Controls System

To make this fixture AirLink ready, simply order one of the following options:

- The integrated [Wireless Lighting Controller](#): ALSC or ALSCH (see ordering guide) as the controls option, or
- Integrated Wireless Controller option (above) with integrated motion sensor: ALSCS (ordering guide for mounting heights) or
- The 7-Pin Photoelectric Control Receptacle: CR7P as the controls option; and either the [5-Pin](#) or [7-Pin Twist Lock Controller](#): ALSC UNV TL5 or ALSC UNV TL7 as an accessory

To see how the components of AirLink system work together, reference the diagram in the controls section of this specsheet. For more information on our AirLink products, visit our website: [www.lsi-airlink.com/airlink-synapse/](http://www.lsi-airlink.com/airlink-synapse/)

#### Stand-Alone Controls

- The integral passive infrared motion sensor (IMS) activates switching of luminaire light levels (see the controls section for more details).
- The 7-pin ANSI C136.41-2013 photocontrol receptacle option (CR7P) is available for twist lock photocontrols or wireless control modules.
- The Button Type Photocells (PCI) are capable of switching luminaires ON/OFF in response to the amount of available daylight.

### Installation

- A single fastener secures the hinged door, underneath the housing and provides quick & easy access to the electrical compartment for installing/servicing.
- Included terminal block provides quick and easy on-site wiring.
- Utilizes LSI's traditional 3" drill pattern for easy fastening of LSI products. (See drawing on page 1)

### Warranty

- LSI LED Fixtures carry a 5-year warranty.

### Listings

- Listed to UL 1598 and UL 8750.
- RoHS Compliant.
- American Recovery and Reinvestment Act Funding Compliant.
- IDA compliant; with 3000K color temperature selection.
- Title 24 Compliant; see local ordinance for qualification information.
- Suitable For wet Locations.
- IP66 rated Luminaire. IP66 rated optical chamber.
- 3G rated for ANSI C136.31 high vibration applications

## Performance

ELECTRICAL DATA (AMPS)*							
Lumens	Watts	120V	208V	240V	277V	347V	480V
9L	68.2	0.6A	0.3A	0.3A	0.2A	0.2A	0.1A
12L	93.1	0.8A	0.4A	0.4A	0.3A	0.3A	0.2A
18L	148.5	1.2A	0.7A	0.6A	0.5A	0.4A	0.3A
24L	188.8	1.6A	0.9A	0.8A	0.7A	0.5A	0.4A
30L	248.6	2.1A	1.2A	1.0A	0.9A	0.7A	0.5A
36L	317.8	2.6A	1.5A	1.3A	1.1A	0.9A	0.7A
42L	393.4	3.3A	1.9A	1.6A	1.4A	1.1A	0.8A

\*Electrical data at 25C (77F). Actual wattage may differ by +/-10%

ELECTRICAL DATA - PHOSPHOR CONVERTED AMBER (AMPS)*							
Lumens	Watts	120V	208V	240V	277V	347V	480V
9L	74.3	0.6A	0.4A	0.3A	0.3A	0.2A	0.2A
12L	102.9	0.9A	0.5A	0.4A	0.4A	0.3A	0.2A

\*Electrical data at 25C (77F). Actual wattage may differ by +/-10%

RECOMMENDED LUMEN MAINTENANCE <sup>1</sup> (24-42L)					
Ambient	Initial <sup>2</sup>	25 hr <sup>2</sup>	50 hr <sup>2</sup>	75 hr <sup>3</sup>	100 hr <sup>3</sup>
0-40 C	100%	100%	97%	94%	92%

RECOMMENDED LUMEN MAINTENANCE <sup>1</sup> (9-18L)					
Ambient	Initial <sup>2</sup>	25 hr <sup>2</sup>	50 hr <sup>2</sup>	75 hr <sup>3</sup>	100 hr <sup>3</sup>
0-50 C	100%	96%	91%	87%	83%

- 1- Lumen maintenance values at 25C are calculated per TM-21 based on LM-80 data and in-situ testing.
- 2- In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times the IESNA LM-80-08 total test duration for the device under testing.
- 3- In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times the IESNA LM-80-08 total test duration for the device under testing

DELIVERED LUMENS*					
Lumen Package	Distribution	Phosphor Converted Amber (Peak 610nm)			Wattage
		Delivered Lumens	Efficacy	BUG Rating	
9L	2	5958	80	B2-U0-G1	74
	2 IL	3735	50	B0-U0-G1	
	3	6196	83	B1-U0-G1	
	3 IL	4205	56	B0-U0-G1	
	5W	5528	74	B3-U0-G1	
	FT	5922	79	B1-U0-G2	
	FT IL	3712	50	B0-U0-G1	
	FTA	5997	80	B2-U0-G2	
12L	FTA IL	4254	57	B0-U0-G1	103
	2	7559	73	B2-U0-G2	
	2 IL	4738	46	B0-U0-G1	
	3	7860	76	B2-U0-G2	
	3 IL	5335	52	B0-U0-G1	
	5W	7013	68	B3-U0-G2	
	FT	7513	73	B2-U0-G2	
	FT IL	4709	46	B0-U0-G2	
	FTA	7608	74	B2-U0-G2	
	FTA IL	5397	52	B0-U0-G1	

\*LED Chips are frequently updated therefore values are nominal

LUMINAIRE EPA CHART - SLM									
Tilt Degree					Tilt Degree				
	0°	30°	45°		0°	30°	45°		
Single	0.5	2.1	2.6	T90°	1.2	2.9	3.6		
D180°	1.1	2.1	2.6	TN120°	1.3	4.4	5.4		
D90°	0.9	2.5	3.1	O90°	1.2	2.9	3.6		

Specifications and dimensions subject to change without notice.



# Slice Medium - SLM Outdoor LED Area Light

DELIVERED LUMENS*															
Lumen Package	Distribution	CRI	2700K CCT			3000K CCT			4000K CCT			5000K CCT			Wattage
			Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	
9L	2	70	8349	122	B2-U0-G2	8576	125	B2-U0-G2	9396	137	B2-U0-G2	9784	143	B2-U0-G2	69
	2 IL	70	5185	76	B0-U0-G1	5326	78	B0-U0-G1	5835	85	B0-U0-G1	6076	89	B0-U0-G1	
	3	70	8571	125	B1-U0-G2	8804	129	B1-U0-G2	9646	141	B2-U0-G2	10044	147	B2-U0-G2	
	3 IL	70	6283	92	B0-U0-G2	6454	94	B0-U0-G2	7071	103	B0-U0-G2	7363	107	B0-U0-G2	
	5W	70	8158	119	B3-U0-G2	8380	122	B3-U0-G2	9181	134	B3-U0-G2	9560	140	B4-U0-G2	
	FT	70	8337	122	B2-U0-G2	8563	125	B2-U0-G2	9382	137	B2-U0-G2	9769	143	B2-U0-G2	
	FT IL	70	5393	79	B0-U0-G2	5540	81	B0-U0-G2	6069	89	B0-U0-G2	6320	92	B0-U0-G2	
	FTA	70	8459	123	B2-U0-G2	8689	127	B2-U0-G2	9520	139	B2-U0-G2	9913	145	B2-U0-G2	
FTA IL	70	6200	91	B1-U0-G1	6369	93	B1-U0-G1	6978	102	B1-U0-G1	7266	106	B1-U0-G1		
12L	2	70	11157	119	B2-U0-G2	11461	122	B2-U0-G2	12556	134	B3-U0-G2	13075	139	B3-U0-G2	94
	2 IL	70	6929	74	B1-U0-G1	7117	76	B1-U0-G2	7798	83	B1-U0-G2	8119	86	B1-U0-G2	
	3	70	11454	122	B2-U0-G2	11766	125	B2-U0-G2	12890	137	B2-U0-G2	13423	143	B2-U0-G2	
	3 IL	70	8396	89	B0-U0-G2	8625	92	B0-U0-G2	9449	101	B0-U0-G2	9839	105	B0-U0-G2	
	5W	70	10902	116	B4-U0-G2	11199	119	B4-U0-G2	12269	131	B4-U0-G2	12775	136	B4-U0-G2	
	FT	70	11141	119	B2-U0-G2	11444	122	B2-U0-G2	12538	133	B2-U0-G3	13055	139	B2-U0-G3	
	FT IL	70	7207	77	B0-U0-G2	7403	79	B0-U0-G2	8110	86	B0-U0-G2	8445	90	B0-U0-G2	
	FTA	70	11304	120	B2-U0-G2	11612	124	B2-U0-G2	12722	135	B2-U0-G2	13247	141	B2-U0-G2	
FTA IL	70	8286	88	B1-U0-G1	8511	91	B1-U0-G1	9325	99	B1-U0-G1	9710	103	B1-U0-G1		
18L	2	70	16714	112	B3-U0-G3	17168	115	B3-U0-G3	18809	126	B3-U0-G3	19586	131	B3-U0-G3	150
	2 IL	70	10379	69	B1-U0-G2	10662	71	B1-U0-G2	11681	78	B1-U0-G2	12163	81	B1-U0-G2	
	3	70	17158	115	B2-U0-G3	17625	118	B2-U0-G3	19310	129	B3-U0-G3	20107	134	B3-U0-G3	
	3 IL	70	12578	84	B1-U0-G3	12920	86	B1-U0-G3	14155	95	B1-U0-G3	14739	99	B1-U0-G3	
	5W	70	16331	109	B4-U0-G2	16776	112	B4-U0-G2	18379	123	B4-U0-G2	19138	128	B5-U0-G3	
	FT	70	16689	112	B3-U0-G3	17143	115	B3-U0-G3	18781	126	B3-U0-G4	19557	131	B3-U0-G4	
	FT IL	70	10795	72	B1-U0-G2	11089	74	B1-U0-G2	12149	81	B1-U0-G3	12651	85	B1-U0-G3	
	FTA	70	16934	113	B3-U0-G3	17395	116	B3-U0-G3	19058	127	B3-U0-G3	19844	133	B3-U0-G3	
FTA IL	70	12412	83	B1-U0-G1	12750	85	B1-U0-G2	13969	93	B1-U0-G2	14546	97	B1-U0-G2		
24L	2	70	20880	112	B3-U0-G3	22701	121	B4-U0-G3	24276	130	B4-U0-G3	24784	133	B4-U0-G3	187
	2 IL	70	13100	70	B1-U0-G2	14243	76	B1-U0-G2	15231	81	B1-U0-G2	15550	83	B1-U0-G2	
	3	70	21739	116	B3-U0-G3	23636	126	B3-U0-G4	25275	135	B3-U0-G4	25804	138	B3-U0-G4	
	3 IL	70	15828	85	B1-U0-G3	17209	92	B1-U0-G3	18403	98	B1-U0-G4	18788	100	B1-U0-G4	
	5W	70	20632	110	B5-U0-G3	22432	120	B5-U0-G3	23988	128	B5-U0-G3	24490	131	B5-U0-G3	
	FT	70	21611	116	B3-U0-G4	23496	126	B3-U0-G4	25126	134	B3-U0-G4	25652	137	B3-U0-G4	
	FT IL	70	13692	73	B1-U0-G3	14886	80	B1-U0-G3	15919	85	B1-U0-G3	16252	87	B1-U0-G3	
	FTA	70	21496	115	B3-U0-G3	23371	125	B3-U0-G3	24992	134	B3-U0-G3	25515	136	B3-U0-G3	
FTA IL	70	15226	81	B1-U0-G2	16555	89	B1-U0-G2	17703	95	B2-U0-G2	18073	97	B2-U0-G2		
30L	2	70	26581	108	B4-U0-G3	28900	117	B4-U0-G3	30905	125	B4-U0-G3	31551	128	B4-U0-G3	247
	2 IL	70	16677	68	B1-U0-G2	18132	73	B1-U0-G2	19390	79	B1-U0-G2	19796	80	B1-U0-G2	
	3	70	27675	112	B3-U0-G4	30089	122	B3-U0-G4	32176	130	B3-U0-G4	32850	133	B3-U0-G4	
	3 IL	70	20150	82	B1-U0-G4	21908	89	B1-U0-G4	23428	95	B1-U0-G4	23918	97	B1-U0-G4	
	5W	70	26266	106	B5-U0-G3	28557	116	B5-U0-G3	30538	124	B5-U0-G4	31177	126	B5-U0-G4	
	FT	70	27512	111	B3-U0-G4	29912	121	B3-U0-G4	31987	130	B3-U0-G4	32656	132	B3-U0-G5	
	FT IL	70	17430	71	B1-U0-G3	18951	77	B1-U0-G4	20266	82	B1-U0-G4	20690	84	B1-U0-G4	
	FTA	70	27365	111	B3-U0-G3	29752	120	B4-U0-G3	31816	129	B4-U0-G3	32482	132	B4-U0-G3	
FTA IL	70	19384	78	B2-U0-G2	21075	85	B2-U0-G2	22537	91	B2-U0-G2	23008	93	B2-U0-G2		
36L	2	70	32214	102	B4-U0-G3	35025	111	B4-U0-G3	37454	118	B4-U0-G3	38238	121	B4-U0-G4	317
	2 IL	70	20212	64	B1-U0-G2	21975	69	B1-U0-G3	23499	74	B2-U0-G3	23991	76	B2-U0-G3	
	3	70	33540	106	B3-U0-G4	36466	115	B3-U0-G5	38996	123	B3-U0-G5	39812	126	B3-U0-G5	
	3 IL	70	24421	77	B1-U0-G4	26551	84	B1-U0-G4	28393	90	B1-U0-G4	28987	92	B1-U0-G5	
	5W	70	31832	101	B5-U0-G4	34609	109	B5-U0-G4	37010	117	B5-U0-G4	37785	119	B5-U0-G4	
	FT	70	33342	105	B3-U0-G5	36251	114	B3-U0-G5	38766	122	B4-U0-G5	39577	125	B4-U0-G5	
	FT IL	70	21125	67	B1-U0-G4	22968	73	B1-U0-G4	24561	78	B1-U0-G4	25075	79	B1-U0-G4	
	FTA	70	33164	105	B4-U0-G3	36058	114	B4-U0-G4	38559	122	B4-U0-G4	39366	124	B4-U0-G3	
FTA IL	70	23492	74	B2-U0-G2	25541	81	B2-U0-G2	27313	86	B2-U0-G2	27885	88	B2-U0-G2		
42L	2	70	36785	94	B4-U0-G3	39994	103	B5-U0-G4	42768	110	B5-U0-G4	43663	112	B5-U0-G4	390
	2 IL	70	23079	59	B1-U0-G3	25093	64	B2-U0-G3	26833	69	B2-U0-G3	27395	70	B2-U0-G3	
	3	70	38299	98	B3-U0-G5	41640	107	B4-U0-G5	44528	114	B4-U0-G5	45460	117	B4-U0-G5	
	3 IL	70	27886	72	B1-U0-G4	30319	78	B1-U0-G5	32422	83	B1-U0-G5	33100	85	B1-U0-G5	
	5W	70	36349	93	B5-U0-G4	39520	101	B5-U0-G4	42261	108	B5-U0-G4	43145	111	B5-U0-G4	
	FT	70	38073	98	B4-U0-G5	41395	106	B4-U0-G5	44266	114	B4-U0-G5	45192	116	B4-U0-G5	
	FT IL	70	24122	62	B1-U0-G4	26226	67	B1-U0-G4	28045	72	B1-U0-G4	28632	73	B1-U0-G4	
	FTA	70	37870	97	B4-U0-G4	41174	106	B4-U0-G4	44030	113	B4-U0-G4	44951	115	B4-U0-G4	
FTA IL	70	26825	69	B2-U0-G2	29165	75	B2-U0-G2	31188	80	B2-U0-G2	31841	82	B2-U0-G2		

\*LED Chips are frequently updated therefore values are nominal

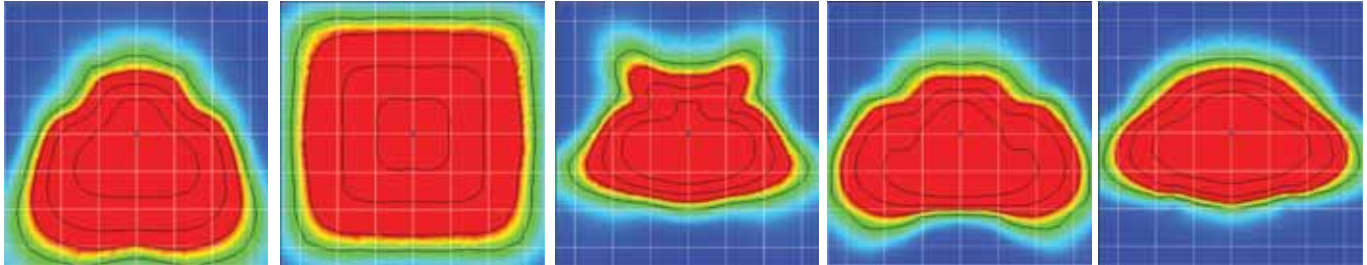
Specifications and dimensions subject to change without notice.



# Slice Medium - SLM Outdoor LED Area Light

## Performance (Cont.)

All published luminaire photometric testing performed to IESNA LM-79 standards. ISO footcandle plots below demonstrate the Slice (SLM) light patterns only. Not for total fixture output. For complete specifications and IES files, see website.



FT

5W

FTA

Type 3

Type 2

## Ordering Guide

TYPICAL ORDER EXAMPLE: **SLM LED 36L SIL FTA UNV DIM 50 70CRI ALSCS04 BRZ IL**

Luminaire Prefix	Light Source	Lumen Package*	Light Output	Distribution	Orientation <sup>1</sup>	Voltage	Driver
<b>SLM</b> Slice Medium	<b>LED</b>	9L - 9,000 lms 12L - 12,000 lms <b>18L - 18,000 lms</b> 24L - 24,000 lms 30L - 30,000 lms 36L - 36,000 lms 42L - 42,000 lms  *Consult factory for programmable wattages and lumen packages	<b>SIL - Silicone</b>	2 - Type 2 3 - Type 3 5W - Type 5 Wide <b>FT - Forward Throw</b> FTA - Forward Throw Automotive	<b>(blank) - standard</b> L - Optics rotated left 90 R - Optics rotated right 90	<b>UNV - Universal Voltage</b> <b>(120-277V)</b> HV - High Voltage (347-480V)	<b>DIM - 0-10V Dimming (0-10%)</b>

Color Temp	Color Rendering	Controls (Choose One)	Finish	Options
50 - 5,000 CCT <b>40 - 4,000 CCT</b> 30 - 3,000 CCT <sup>2</sup> 27 - 2,700 CCT <sup>2</sup> AMB - Phosphor Converted Amber <sup>2,3</sup>	<b>70CRI - 70 CRI</b>	<b>(Blank) - None</b>  <b>Wireless Controls System</b> ALSC - AirLink Synapse Control System <sup>4</sup> ALSCH - AirLink Synapse Control System Host / Satellite <sup>4,5</sup> ALSCS01 - AirLink Synapse Control System with 8-12' Motion Sensor <sup>4</sup> ALSCHS01 - AirLink Synapse Control System Host / Satellite with 8-12' Motion Sensor <sup>4,5</sup> ALSCS02 - AirLink Synapse Control System with 12-20' Motion Sensor <sup>4</sup> ALSCHS02 - AirLink Synapse Control System Host / Satellite with 12-20' Motion Sensor <sup>4,5</sup> ALSCS04 - AirLink Synapse Control System with 20-40' Motion Sensor <sup>4</sup> ALSCHS04 - AirLink Synapse Control System Host / Satellite with 20-40' Motion Sensor <sup>4,5</sup>  <b>Stand-Alone Controls</b> EXT - 0-10v Dimming (from external signal) IMSOM1 - Integral Motion Sensor 8-12' 120-277V <sup>4,6</sup> IMSOM2 - Integral Motion Sensor 12-20' 120-277V <sup>4,6</sup> IMSOM4 - Integral Motion Sensor 20-40' 120-277V <sup>4,6</sup> IMSOM1HV - Integral Motion Sensor 8-12' 347-480V <sup>6</sup> IMSOM2HV - Integral Motion Sensor 12-20' 347-480V <sup>6</sup> IMSOM4HV - Integral Motion Sensor 20-40' 347-480V <sup>6</sup> CR7P - 7 Pin Control Receptacle ANSI C136.41 <sup>7</sup>  <b>Button Type Photocells</b> PCI120 - 120V PCI208-277 - 208-277V PCI347 - 347V	<b>BRZ - Bronze</b> BLK - Black GPT - Graphite MSV - Metallic Silver WHT - White PLP - Platinum Plus SVG - Satin Verde Green	<b>(Blank) - None</b> <b>IL - Integral Louver HSS<sup>1</sup></b>



# Slice Medium - SLM Outdoor LED Area Light

## Accessory Ordering Information<sup>8</sup>

Description	Order Number	Description	Order Number
PC120 Photocell for use with CR7P option (120V) <sup>9</sup>	122514	DFK208, 240 Double Fusing (208V, 240V)	DFK240
PC208-277 Photocell for use with CR7P option (208V, 240V, 277V) <sup>9</sup>	122515	DFK480 Double Fusing (480V)	DFK480
PC347 Photocell for use with CR7P option (347V) <sup>9</sup>	122516	DFK347 Double Fusing (347V)	DFK347
PC480 Photocell for use with CR7P option (480V) <sup>9</sup>	1225180	X5RPP - Round Pole Adapter for 5" Poles <sup>10</sup>	379968CLR
ALSC UNV TL5 - Airlink 5Pin Twist Lock Controller <sup>1,9</sup>	661409	IL - Integral Louver HSS	684812
ALSC UNV TL7 - Airlink 7Pin Twist Lock Controller <sup>1,9</sup>	661410	Universal Mounting Bracket (UMB) <sup>10</sup>	684616CLR
PMOS24 - 24V Pole-Mount Occupancy Sensor (ALSC/H Compatible) <sup>10</sup>	663284CLR	Adjustable Slip Fitter (ASF) <sup>10</sup>	688138CLR
IMS/PC Remote Configurator Tool	584929	Pole Quick Mount Bracket - Square Pole <sup>10</sup>	687073CLR
X3RPP - Round Pole Adapter for 3" Round Tapered Poles <sup>10</sup>	408273CLR	Pole Quick Mount Bracket - 4-5" Round Pole <sup>10</sup>	689903CLR
X4RPP - Round Pole Adapter for 4" Poles <sup>10</sup>	379967CLR	15° Tilt Pole Quick Mount Bracket - Square Pole <sup>10</sup>	688003CLR
FK120 Single Fusing (120V)	FK120	15° Tilt Pole Quick Mount Bracket - 4-5" Round Pole <sup>10</sup>	689905CLR
FK277 Single Fusing (277V)	FK277	BKS XBO WM * CLR Wall Mount Bracket <sup>10</sup>	382132CLR

### FOOTNOTES:

- 1 - Not available on "Type 5W" distribution.
- 2 - Consult Factory for availability.
- 3 - Only available in 9L and 12L Lumen Packages
- 4 - Not available in HV.
- 5 - Consult Factory for Site Layout
- 6 - IMS is field adjustable, via a hand held Remote Configurator Tool, which must be ordered separately. See Accessory Ordering Information.

7 - Control device must be ordered separately. 7 pin standard. See Accessory Ordering Information.

8 - Accessories are shipped separately and field installed.

9 - Factory installed CR7P option required. See Options.

10 - "CLR" denotes finish. See Finish options.

## Accessories/Options

### Integral Louver (IL)

Accessory Integral Louver available for improved back-light control without sacrificing street side performance. LSI's Integral Louver (IL) option delivers backlight control that significantly reduces light spill behind the pole for applications with pole locations close to adjacent properties. The integrated louvers' design maximizes forward-reflected light while - reducing glare, maintaining the optical distribution selected, and most importantly, eliminating light trespass. The Integral louver rotates with the optical distribution.

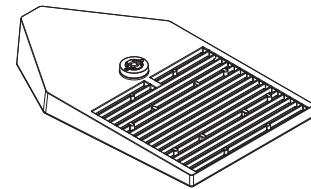
#### Luminaire Shown with Integral Louver (IL)



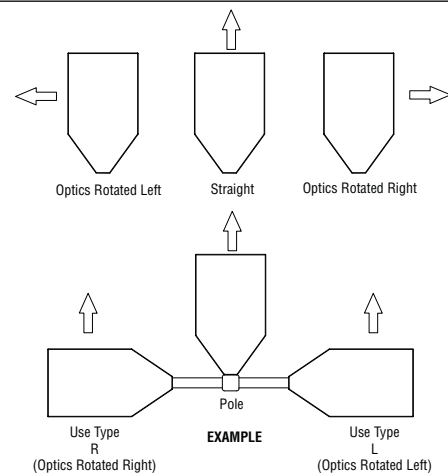
### 7 Pin Photoelectric Control

7-pin ANSI C136.41-2013 control receptacle option available for twist lock photocontrols or wireless control modules. Control accessories sold separately. Dimming leads from the receptacle will be connected to the driver dimming leads (Consult factory for alternate wiring).

#### Fixture Shown with CR7P



### Optics Rotation





# Slice Medium - SLM Outdoor LED Area Light

## Stand-alone Controls: Occupancy Sensor (IMS)

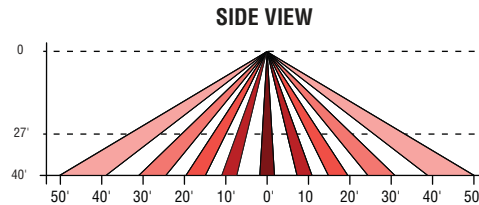
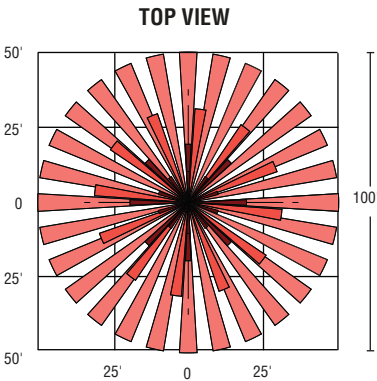
The integral passive infrared motion sensor activates switching of luminaire light levels. Standard Factory settings: High level light is activated and increased to full bright upon detection of motion. Lowlight level (10% maximum drive current) is activated when target zone is absent of motion activity for ~5 minutes. See coverage diagram for detection cone.

The Remote Configurator Tool allows for easy and safe programming of each luminaire from ground level. See the [Remote Configurator User Guide](#) for programming instructions.

When ordering the Stand-alone Occupancy Sensor on the fixture, you must include IMS (see ordering guide for mounting height options) as the controls option in the fixture nomenclature.

To order as a motion sensor with the AirLink Wireless Control System, see ordering guide under "Wireless Controls System" and select the ALSCS controls option with the desired mounting height.

## IMS Coverage Diagrams



## Remote Configurator Tool



## Luminaire Shown with IMS





# Slice Medium - SLM Outdoor LED Area Light



**AirLink™**  
enabled by Synapse®

The AirLink enabled by Synapse Wireless Lighting Control System is the perfect solution for commercial, industrial and municipal applications, such as: auto dealerships, parking lots, garages, shopping complexes and warehouses.

AirLink utilizes robust wireless communication via 2.4 GHz Self-Healing Mesh Network which not only increases reliability and accuracy of system, but also eliminates single point of failure.

The flexibility of the system make it perfect for new construction and retrofit projects. The user-friendly AirLink web application is accessible through any device with an internet connection and allows for complete customization of the system's features.

Some capabilities of the system include: occupancy/vacancy sensing, daylight harvesting, scheduling, high-end trim, dimming, zone control, BMS integration and energy monitoring.

## The AirLink System

### Wireless controls & sensors



### Centralized control & integration



Site Manager Controller



Gateway Module



WiFi, Cellular or Ethernet Connection

### Simple-to-use software



AirLink Site Manger: Lighting control web app

## Contact LSI Controls



**Sales**  
controls.sales@lsi-industries.com



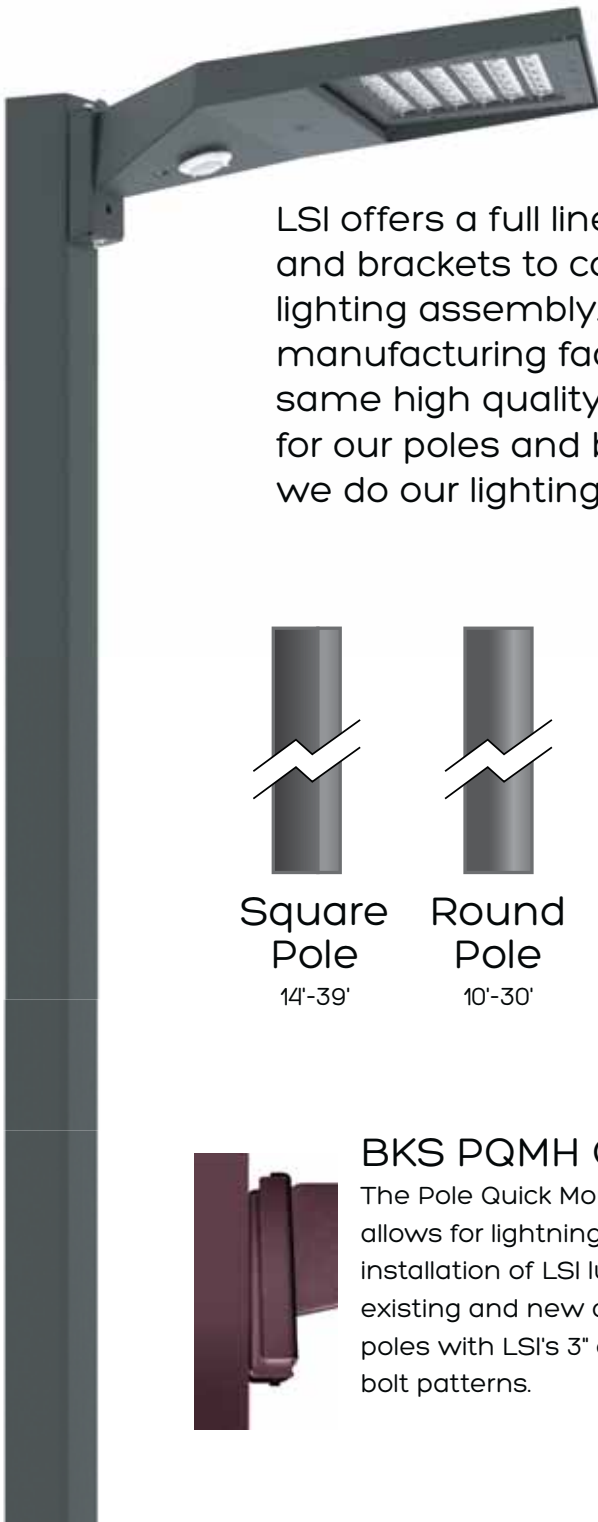
**Support**  
controls.support@lsi-industries.com  
1 (800) 436-7800 (support, option 8)



**More information**  
For more information on AirLink, visit our website at [www.lsi-airlink.com](http://www.lsi-airlink.com)



# poles & Brackets

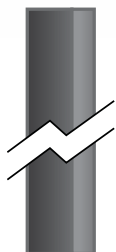


LSI offers a full line of poles and brackets to complete your lighting assembly. Our USA manufacturing facility has the same high quality standards for our poles and brackets as we do our lighting fixtures.



### BKA UMB CLR

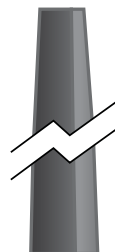
The 3G rated Universal Mounting Bracket (UMB) allows for seamless integration of LSI Luminaires onto existing or new construction poles. The UMB bracket was designed specifically for square or round (tapered/straight) poles with (2) mounting hole spaces between 3.5"-5".



**Square Pole**  
14'-39'



**Round Pole**  
10'-30'



**Tapered Pole**  
20'-39'



### BKA ASF CLR

The adjustable Slip Fitter is a 3G rated rugged die cast aluminum adapter to mount LSI luminaires onto a 2" (51mm) IP, 2.375" (60mm) O.D. tenon. The Adjustable Slip Fitter can be rotated 180° allowing for tilting LSI luminaires up to 45° and 90° when using a vertical tenon.



### BKS PQMH CLR

The Pole Quick Mount Bracket allows for lightning fast installation of LSI luminaires onto existing and new construction poles with LSI's 3" or 5" standard bolt patterns.



### BKS PQM15 CLR

The Pole Quick Mount Bracket allows for preset 15° up tilt of LSI luminaires for greater throw of light and increased vertical illumination as well as fast installation onto poles with LSI's 3" or 5" bolt pattern.

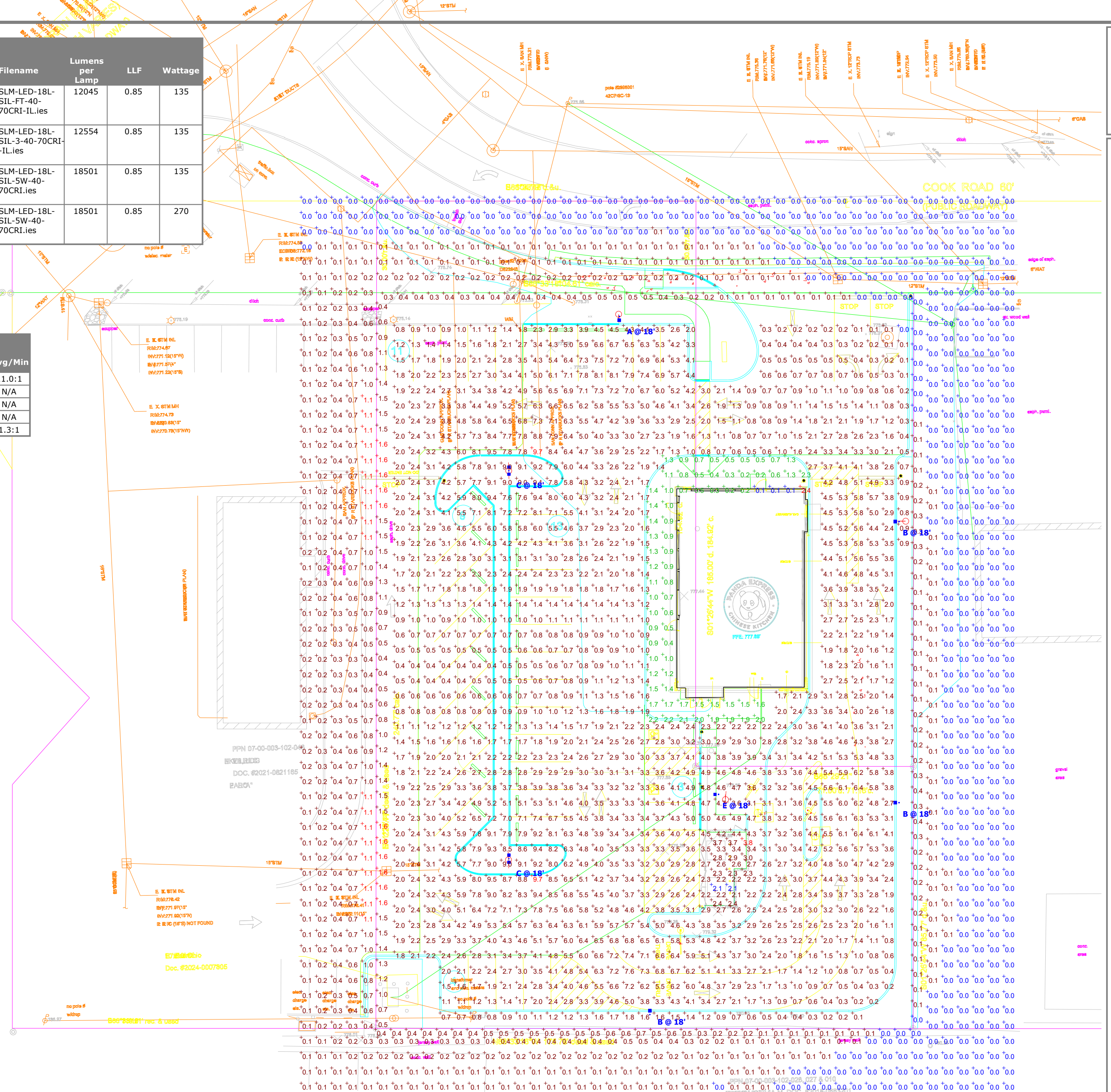


Symbol	Label	QTY	Catalog Number	Description	Filename	Lumens per Lamp	LLF	Wattage
	A	1	SLM-LED-18L-SIL-FT-40-70CRI-IL	CONTACT RYAN ZINSELMEIER-314-531-2600	SLM-LED-18L-SIL-FT-40-70CRI-IL.ies	12045	0.85	135
	B	3	SLM-LED-18L-SIL-3-40-70CRI-IL	CONTACT RYAN ZINSELMEIER-314-531-2600	SLM-LED-18L-SIL-3-40-70CRI-IL.ies	12554	0.85	135
	E	1	SLM-LED-18L-SIL-5W-40-70CRI		SLM-LED-18L-SIL-5W-40-70CRI.ies	18501	0.85	135
	C	2	SLM-LED-18L-SIL-5W-40-70CRI		SLM-LED-18L-SIL-5W-40-70CRI.ies	18501	0.85	270

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
CALC SUMMARY- AROUND BUILDING	+	1.1 fc	2.4 fc	0.1 fc	24.0:1	11.0:1
CALC SUMMARY- OUTSIDE PROPERTY LINE	+	0.1 fc	1.1 fc	0.0 fc	N/A	N/A
CALC SUMMARY- PAVED SURFACE	+	3.2 fc	9.7 fc	0.0 fc	N/A	N/A
CALC SUMMARY- PROPERTY LINE	+	0.5 fc	1.6 fc	0.0 fc	N/A	N/A
TRASH ENCLOSURE	+	2.8 fc	3.8 fc	2.1 fc	1.8:1	1.3:1

**Note**

1. MOUNTING HEIGHT OF 18' (16'POLE)
2. CALCULATIONS TAKEN AT GROUND LEVEL
3. CONTACT VILLA LIGHTING- RYAN ZINSELMEIER- RYAN.ZINSELMEIER@VILLALIGHTING.COM- 314-531-2600
4. LAYOUT IS AN ESTIMATE



**Plan View**  
Scale - 1" = 25ft

PANDA EXPRESS  
NORTH RIDGEVILLE

**Designer**  
R. ZINSELMEIER  
**Date**  
07/16/2025  
**Scale**  
NOTED  
**Drawing No.**  
Summary

# ColorLINE

Neon-inspired tubing

## Specifications

**Dimensions**..... Width..... 11 mm (0.44 in)  
Base width..... 15 mm (0.59 in)  
Height..... 25 mm (1.00 in)  
Lengths..... 0.6 m (2 ft); 1.2 m (4 ft);  
1.8 m (6 ft); 2.4 m (8 ft)

**Factory bends**..... 245 mm (9.75 in) radius (radial and flat bend)

**Approx. cut increments** ..... 60 mm (2.4 in)

**In-field bends**..... Radial bend..... 5.8 m (19 ft)  
Flat bend..... 1.8 m (6 ft)

**Operating temperature**..... -40° C to +70° C

**Protection class** ..... IP66

**Binning**..... MacAdam Ellipse 3-Step\*

**Power per meter/foot** ..... 7.5 W / 2.28 W

**Colors** ..... Colors retain hue when non-illuminated  
(see "Unlit Product Color Chart" for Pantone color equivalents)

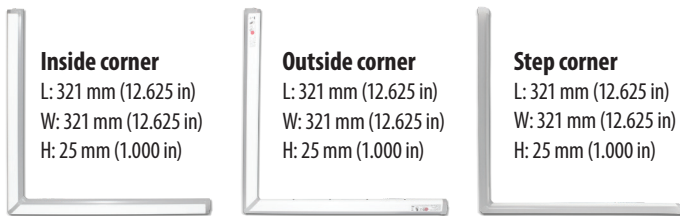
**Mounting** ..... Dual-position mounting clips (400381-25)  
orient in two directions

Color	Lumens per m/ft
Red	91.90 / 28.01
Orange	117.52 / 35.82
Yellow	76.31 / 23.26
Green	72.08 / 21.97
Blue	22.77 / 6.94
White (6500 K)	161.61 / 49.26
Warm White (3500 K)	40.94 / 12.48



ColorLINE is covered by US and foreign patents pending and covered by the following US patents issued: 6,776,504, 6,969,179, and 7,192,157

## Accessories



Color	Inside corner	Outside corner	Step corner
Red, Orange, Yellow, Green, Blue	701800D-IC-Color	701800D-OC-Color	701800D-SC-Color
White (6500 K)	701800-IC-W	701800-OC-W	701800-SC-W
Warm White (3500 K)	701800A-IC-WW	701800A-OC-WW	701800A-SC-WW

### Joint covers

701807  
Snap-on, frosted joint covers for clean finish  
Illuminated mitered corners



**Mounting clip**  
400381-25



## Ordering information

Color	Part number
Red	701800D-R-X
Orange	701800D-O-X
Yellow	701800D-Y-X
Green	701800D-G-X
Blue	701800D-B-X
White (6500 K)	701800-W-X
Warm White (3500 K)	701800A-WW-X

NOTE: X = desired length.  
See table below for length codes.

Code	Item description	Actual length
2	0.6-m (2-ft) Tube	626 mm (24.66 in)
4	1.2-m (4-ft) Tube	1236 mm (48.66 in)
6	1.8-m (6-ft) Tube	1846 mm (72.66 in)
8	2.4-m (8-ft) Tube	2455 mm (96.66 in)

## Power supply capacity

12 VDC Power supply†	All colors
	Maximum meters/feet
20 W Power supply	2.5 / 8
25 W Power supply (EU/ROW ONLY)	3 / 10
30 W Power supply (EU/ROW ONLY)	3.6 / 12
60 W Power supply	7.3 / 24
2 x 60 W Power supply	2 x 7.3 / 24
2 x 75 W Power supply (EU/ROW ONLY)	2 x 9.1 / 30
Power used per meter/foot in watts	5.9 / 1.8

NOTE: When mixing modules of different sizes/colors or various products on the same power supply, simply add all the power requirements for the respective footages of each product. Then choose appropriate power supplies to provide adequate power output. The actual number of power supplies needed may vary based on how the materials are distributed across the project.

‡ Configured for Class 2 Output.

## Unlit product color chart†

Red/Ruby Red PANTONE 485 C	Orange/Citrus Orange PANTONE 151 C	Yellow/Noviol Gold PANTONE 3975 C
Green/Emerald Green PANTONE 355 C	Blue/Bromo Blue PANTONE 2935 C	

\* White (P/N 701800-W-X) and Warm White (P/N 701800A-WW-X) only.

† "Unlit Product Color Chart" provided as a courtesy to give a general idea of product color. Colors in chart not printed using Pantone inks and may vary from actual Pantone number/color. For an accurate representation of product color, a Pantone Color Guide book should be used, or order a sample part. For more information on Pantone, visit Pantone.com.

# ColorLINE

Neon-inspired tubing

## Discontinued part numbers

Part number	Color
701800-O-X	Orange
701800-R-X	Red
701800-Y-X	Yellow
701800A-B-X	Blue
701800A-G-X	Green
701800C-B-X	Bromo Blue
701800C-G-X	Emerald Green
701800C-O-X	Citrus Orange
701800C-R-X	Ruby Red
701800C-Y-X	Noviol Gold

NOTE: Discontinued versions of ColorLINE listed here are presented for reference only and are no longer available for order.

### SloanLED Headquarters

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805.676.3200 • info@SloanLED.com

### SloanLED Europe b.v.

Argonstraat 110, 2718 SN Zoetermeer, NL  
+31 88 12 44 900 • europe@SloanLED.com



SloanLED.com

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Visit product page for details.

Specifications subject to change without notice.



The LED-90 Series combines a low-profile, contemporary appearance with LED economy and dependability. Fully adjustable heads complement any application.

Model: \_\_\_\_\_ Date: \_\_\_\_\_  
Accessories: \_\_\_\_\_  
Job Name: \_\_\_\_\_ Type: \_\_\_\_\_

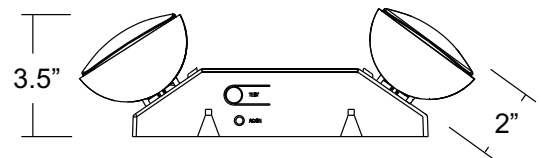
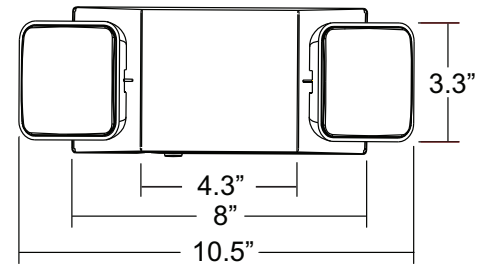
**FEATURES & BENEFITS**

- Each head contains eight long-lasting, efficient, ultrabright, white LEDs consuming 1.1W per head
- Rugged, injection-molded UL 94 5VA flame-retardant, high-temperature thermoplastic housing
- Remote capable - up to two 1.5W **MLED** remote heads
- UL Listed 90 minute emergency run time, 24 hour recharge time
- Suitable for Damp Locations



**SPECIFICATIONS**

- Illumination:** Each head contains eight long-lasting, efficient, ultrabright, white LEDs consuming 1.1W per head
- Housing:** Low-profile, streamlined, die-cast aluminum housing
- Input:** 120/277VAC Dual primary, 60Hz
- Battery:** Maintenance-free NiCad battery
- Operating Temp:** 0°C to 40°C (32°F to 104°F)
- Run Time:** UL Listed 90 minute emergency run time, 24 hour recharge time
- Mounting:** Ceiling or wall mount with universal J-box mounting pattern and rear keyhole slots, includes top and side conduit entry options
- Finishes:** Black or White
- Options:** G2 - Guardian Self-test/Self-diagnostics  
R - Remote Capable (6W)
- Certifications:** UL 924 Listed for Damp Locations, meets or exceeds NEC requirements and NFPA 101
- Warranty:** Any component that fails due to a manufacturing defect is guaranteed for five years with a separate five year prorated warranty on the battery. The warranty does not cover physical damage, abuse or instances of uncontrollable natural forces.



**ORDERING INFORMATION Example: LED-90-BL-G2**

Series	Finish	Options (Factory Installed)	Accessories <sup>2</sup> (Field Installed)
LED-90	BLANK = White BL = Black	G2 = Self-test/Self-diagnostics R1 = Remote Capacity	WG-S = Wire Guard (Back Mount) WPV-2 = Wet Location/Vandal Guard (Back Mount) XG-90 = Poly Guard (Back Mount)

**Notes**  
<sup>1</sup> For use with single or double MLED remote lamps only  
<sup>2</sup> Order as separate line item

## CONSTRUCTION

The LED-90 is a precision-molded unit with lamp housings constructed of UV-stable, 5VA flame-retardant, corrosion-proof thermoplastic. Units resist denting, peeling, scratching and corrosion. Not recommended for outdoor use. Tool-less access provided for easy maintenance, universal J-box mounting pattern and keyhole slots provided for simple installation.

## ILLUMINATION

Illumination is accomplished utilizing high-intensity, long-life LEDs and consumes only 1W nominal power per head. LEDs provide excellent illumination while maximizing energy efficiency. LEDs are a maintenance-free solution, providing up to 100,000 hours of use without failure.

## ELECTRICAL

### Input

Dual-voltage input 120/277VAC @ 60Hz

### Nickel Cadmium Battery – NiCad

Exitronix nickel cadmium batteries are maintenance-free with a life expectancy of 15 years. NiCad technology provides long-lasting, safe and reliable performance by utilizing the jelly roll design and allows a NiCad cell to deliver a much higher maximum current than an equivalent size alternative battery. As a relatively larger area of the electrode is in contact with the active material in each cell, the internal resistance for an equivalent sized NiCad cell is lower which increases the maximum current that can be delivered.

### Emergency

The LED-90 will operate for a minimum of 90 minutes during a loss of power with a 24 hour maximum recharge time for the battery. The LED-90-R will run for 180 minutes in emergency mode if no remote load is connected.

### Brownout Circuit (G2 only)

The brownout circuit monitors the flow of AC current to the unit and triggers the emergency lighting system once a set reduction of AC power occurs. This dip in the voltage will cause many fixtures to extinguish causing loss of normal lighting even though a total power failure has not occurred.

### Low Voltage Disconnect (G2 only)

When the battery's terminal voltage falls below predetermined levels, the low voltage circuit disconnects the emergency lighting load. The disconnect remains in effect until normal power is restored, preventing deep battery discharge and improving the life of the battery. The disconnect will also automatically reconnect the load circuit once the battery voltage returns to a normal value after charging.

### Solid-State Transfer

The unit features a solid-state switching transistor which eliminates damaged contacts or mechanical failures associated with relays. The switching circuit is designed to detect a loss of AC power and automatically energizes the lamps. Upon restoration of the AC voltage, the emergency lamps will switch off and the charger will automatically recharge the battery.

### Overload and Short-Circuit Protection

The Solid-state overload monitoring system in the DC circuit disconnects the lamp load from the battery should excessive wattage demands be made and automatically resets when the overload or short circuit is removed. This overload current protective characteristic eliminates the need for fuses or circuit breakers for the DC load.

### Test Button

Our easily located test button allows for manual verification of proper operation of the transfer circuit and emergency lamps.

## INSTALLATION

Units are mountable in any orientation, on wall or ceilings. A universal mounting pattern and rear keyhole slots are provided as well as top and side conduit entry options for ease of installation.

## Damp Location Rated

Damp Location Rating ensures the fixture is designed to operate safely in outdoor locations that are protected from the direct elements. Damp Location Rated fixtures may be installed indoors. Products with Damp Location Ratings are not designed to withstand constant or significant moisture or direct contact with water or steam.

## Guardian Self-Test/Self-Diagnostics (Option: G2)

The Guardian circuit continuously monitors the operating condition of the AC power, battery supply voltage, emergency lamp continuity and charging circuit.

The purpose of this option is to provide visual signaling in response to a fault at the emergency battery and/or battery charger. If a failure is detected, visual status will occur immediately via the CHARGER LED and/or the BATTERY FAULT LED. The LEDs will stay illuminated until the fault is corrected.

The Guardian circuit also monitors the transfer circuit as well as performing automatic code compliant testing. The Guardian circuit will perform a 30 second discharge and self-test every 28-30 days. A 90 minute discharge and self-test is performed every six months.

## Remote Capable (Option: R)

The R option provides this unit with an additional 2.2W of remote for use with [MLED](#) remote lamps.

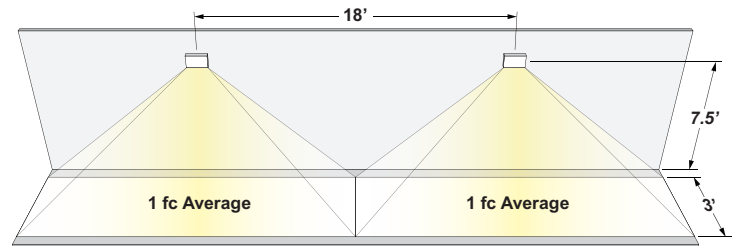
## CONFORMANCE TO CODES & STANDARDS

The LED-90 Series is UL Listed and meets or exceeds the following: UL 924, NEC requirements and NFPA 101.

## ON-CENTER SPACING (Multiple units mounted at a typical 7.5 foot height)

Model	# of LED Lamps	3' Path, 6' Corridor	6' Path, 6' Corridor
LED-60	2	18'	15'

Barron assumes no responsibility for local requirements or specific project variables. This is a guideline to be used as a design aid, not as a guarantee of any code compliance.



**ATLANTIS****1649SK-LED****LARGE WALL MOUNT LANTERN**

Atlantis features a minimalist design for the ultimate in urban sophistication. Constructed of solid aluminum and Dark Sky compliant, Atlantis provides a chic solution to eco-conscious homeowners.

<b>DETAILS</b>	
FINISH:	Satin Black
MATERIAL:	Aluminum
GLASS:	Etched Lens
DIMMABLE:	YES - 0-10V TYPE DIMMER ONLY

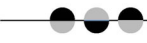
<b>DIMENSIONS</b>	
WIDTH:	9"
HEIGHT:	24"
WEIGHT:	7lb
BACK PLATE:	4.5"W X 6.75"H
EXTENSION:	4"
TOP TO OUTLET:	20.75"

<b>LIGHT SOURCE</b>	
LIGHT SOURCE:	Integrated LED
LED NAME:	LC1-30 & LC2-60
WATTAGE:	15w LED *Included
VOLTAGE:	120v/277v
COLOR TEMP:	3000
LUMENS:	1200
CRI:	96
INCANDESCENT EQUIVALENCY:	2 x 60w
DIMMABLE:	YES - 0-10V TYPE DIMMER ONLY

<b>SHIPPING</b>	
CARTON LENGTH:	12
CARTON WIDTH:	28
CARTON HEIGHT:	8
CARTON WEIGHT:	13

**PRODUCT DETAILS:**

- Suitable for use in wet (outdoor direct rain or sprinkler) locations as defined by NEC and CEC. Meets United States UL Underwriters Laboratories & CSA Canadian Standards Association Product Safety Standards
- Fixture is Dark Sky compliant and engineered to minimize light glare upward into the night sky
- ADA compliant
- Meets California Energy Commission 2013 & 2016 Title regulations/JA8
- Equipped with a 120/277 universal driver. 0-10 dimming.
- 2-year finish warranty
- LED components carry a 5-year limited warranty
- Bold lines and a clean, minimalist style complement contemporary architecture



**PANDA**  
**EXPRESS.**

# Traffic Impact Study

Proposed Panda Express  
North Ridgeville, Ohio

February 11, 2025

Prepared for:

RTM Engineering Consultants  
5137 Utica Ridge Road  
Davenport, Iowa 52807

# TRAFFIC IMPACT STUDY

Proposed Panda Express

North Ridgeville, Ohio

February 11, 2025

Prepared For:

RTM Engineering Consultants  
5137 Utica Ridge Road  
Davenport, Iowa 52807

Prepared By:

TMS Engineers, Inc.  
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REGISTERED ENGINEER NO. E56982  
CERTIFICATION NO. 2234

**"This document was prepared consistent with local agency requirements and/or applicable guidelines contained in this report."**

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## Executive Summary

This Traffic Impact Study (TIS) has been prepared at the request of RTM Engineering Consultants for a proposed Panda Express. The development is located in the City of North Ridgeville, Lorain County, Ohio. The project site is located on the southwest quadrant of the Lorain Road and Lear Nagle Road / Cook Road intersection. **Figure 1.1, Appendix A** shows the proposed location of the development.

The development is expected to consist of a 2,700 square foot restaurant.

The site plan indicates the development will be accessed via the existing Starbucks Driveway on the south side of Cook Road. The driveway is a full access location that permits all ingress and egress turn movements.

**Figure 1.2, Appendix A** shows the proposed site plan for the development.

The development is expected to be open by 2026.

The future design year for the proposed project will be based on the expected volume of new site generated traffic under the expected full build conditions with the development of the proposed Panda Express. The design year will be forecasted from the 2026 opening year.

The Panda Express restaurant is not open for breakfast, therefore the Mid-day and PM peak hours were evaluated for this report.

The weekday Mid-Day peak hour of traffic was determined to be 11:45 AM to 12:45 PM. The weekday PM peak hour of traffic was found to be 4:30 PM to 5:30 PM. These periods were used to forecast expected and future traffic volumes since they reflect the period of the highest volume of vehicular traffic flow for the study area roadways.

The development is expected to generate the following hourly traffic volumes during the peak periods as shown in the table below:

ITE TRIP GENERATION			WEEKDAY TRIP ENDS			
ITE CODE	DESCRIPTION	SIZE	Mid-day Peak Hour of Generator (AM values) (Enter/Exit)		PM Peak Hour of Generator (Enter/Exit)	
			934	Fast Food Restaurant with Drive-through Window	2,700 SF	71
Pass-by Trips (Mid-day Not Available, PM 55%)			-	-	-37	-37
<b>TOTAL NON-PASS-BY TRIPS</b>			<b>71</b>	<b>66</b>	<b>33</b>	<b>31</b>
			<b>137</b>		<b>64</b>	

It was determined that the development would generate 137 trips in the Mid-day peak period and 138 trips in the PM peak period. The years 2026 (Opening Year) and 2036 (Design Year) will be analyzed for the proposed development as the peak hour site generated traffic volumes are less than 500 trips.

**Recommended Improvements to Serve Future Conditions without the Development**

No improvements were recommended to accommodate the forecasted 2026 No-Build conditions at the study area intersections

The following intersection improvements are recommended to accommodate the 2036 No-Build traffic at the intersection of Lorain Road and Cook Road / Lear Nagle Road:

- Extend the westbound right turn lane to a length of 800 feet including a 50 foot taper.
- Construct a 400 foot northbound right turn lane and provide a northbound right turn overlap with the westbound left turn phase.
- Construct a 425 foot southbound right turn lane and provide a southbound right turn overlap with the eastbound left turn phase.

**Recommended Improvements to Mitigate the Traffic Associated with the Development**

No additional improvements were recommended to accommodate the forecasted 2026 and 2036 Build conditions at the study area intersections.

**Development Access Recommendations**

The following lane use and traffic control is recommended at the site access location under the Build conditions:

**Cook Road and Starbucks Driveway**

- Install stop sign control for the northbound driveway approach.
- Construct a 100 foot eastbound right turn lane.

The recommended lane use and traffic control for the study area to accommodate expected Build traffic volumes can be seen in **Figure 4.1, Appendix A**.

Based upon the results of the analysis in this study and the corresponding recommendations, it can be seen that the development traffic can be accommodated without adversely impacting the area roadway network.

# Chapter 1

## Introduction

### 1.1 Purpose of Report

This Traffic Impact Study (TIS) has been prepared at the request of RTM Engineering Consultants for a proposed Panda Express. The development is located in the City of North Ridgeville, Lorain County, Ohio. The project site is located on the southwest quadrant of the Lorain Road and Lear Nagle Road / Cook Road intersection. **Figure 1.1, Appendix A** shows the proposed location of the development.

The development is expected to consist of a 2,700 square foot restaurant.

The site plan indicates the development will be accessed via the existing Starbucks Driveway on the south side of Cook Road. The driveway is a full access location that permits all ingress and egress turn movements.

**Figure 1.2, Appendix A** shows the proposed site plan for the development.

The development is expected to be open by 2026.

The future design year for the proposed project will be based on the expected volume of new site generated traffic under the expected full build conditions with the development of the proposed Panda Express. The design year will be forecasted from the 2026 opening year.

## 1.2 Study Objectives

This study is structured for the following purposes;

- to adequately assess the traffic impacts associated with the proposed development, and identify the level of off-site access and traffic,
- to provide a comprehensive study which evaluates and documents the traffic impacts and off-site improvements, where warranted,
- and to provide a technically sound basis to identify mitigation requirements to off-site traffic impacts.

This study documents the methodologies, findings and conclusions of the analysis, including the basis for all assumptions, traffic parameters utilized and conclusions reached.

The development of future traffic volumes will be based on the forecasting guidelines and methodology found in the Ohio Department of Transportation's **Ohio Traffic Forecasting Manual, Volume 1** <sup>(4)</sup> & **Volume 2** <sup>(5)</sup>.

The traffic impacts will be determined by comparing the existing intersection levels-of-service, delay or density, volume to capacity ratio and queue storage ratio before the construction of the proposed development to the anticipated measures after the development is completed. Traffic analyses for the study area and access intersections will be calculated using the computerized version of the Transportation Research Board's **Highway Capacity Manual 7<sup>TH</sup> Edition** <sup>(1)</sup>, (**HCS2025, Release 8.4**). Data inputs for the HCS software program will be based on the guidance found in the Ohio Department of Transportation's **Analysis & Traffic Simulation Manual (OATS)** <sup>(6)</sup>.

The justification for any changes in the intersections will be determined by comparing data collected of the existing traffic conditions to the criteria established by the **Ohio Manual of Uniform Traffic Control Devices** <sup>(2)</sup> and professional engineering judgment from an on-site field review.

Intersection geometric design guidelines will be based in the information and procedures found in the Ohio Department of Transportation's **Location & Design Manual, Volume 1** <sup>(3)</sup>.

### 1.3 Intersection Capacity & Levels-of-Service

Intersection capacity analyses will be performed at the development access intersection using the procedures outlined in the computerized version of the Transportation Research Board’s **Highway Capacity Manual** <sup>(1)</sup>.

The **HCM** <sup>(1)</sup> is the most widely used document in the transportation industry. It contains a set of methodologies and application procedures for evaluating the capacity and quality of service of various transportation facilities. The **HCM** <sup>(1)</sup> is built from more than 60 years of research work and represents a body of expert transportation consensus.

The capacity analysis procedures provide a calculated “average vehicle delay”, which is based on traffic volumes, number of lanes, type of traffic control, channelization, grade, and percentage of large vehicles in the traffic stream at each intersection. The average delay calculated at an intersection is then assigned a “grade” or level of service (LOS) ranging from LOS A, the best, to LOS F, the worst based upon driver expectation. The intersection LOS “grades” as defined by the Transportation Research Board are as follows:

**Table 1.1 Intersection Levels-of-Service**

LOS	UNSIGNALIZED AVERAGE DELAY PER VEHICLE (seconds/vehicle)	SIGNALIZED AVERAGE DELAY PER VEHICLE (seconds/vehicle)
A	≤ 10.0	≤ 10.0
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	> 50	> 80

Intersection capacity analyses will be performed in order to estimate the maximum amount of traffic that can be accommodated by the intersection while maintaining recommended operational qualities. No-Build and Build peak hour traffic volumes will be analyzed to determine the level-of-service (LOS) at the study area intersections.

The selection of the design level-of-service is most frequently chosen from Section 5.9 of the Ohio Department of Transportation’s **OATS Manual** <sup>(6)</sup>. In most cases, a level-of-service E is considered the maximum delay threshold after which improvements should be investigated to determine if the delay can be reduced to a level of E or better. For the intersection as a whole, LOS D is normally considered to be the maximum threshold. The following table from Section 5.9 details the operation goals for intersection analyses (All-Way Stop Control, Two-Way Stop Control, Signalized, & Roundabout).

**Table 1.2 Intersection Operational Goals**

RESULT	INSIDE AN MPO	OUTSIDE AN MPO
Intersection LOS	D or BETTER	C or BETTER
Approach LOS	E or BETTER	
Control LOS	E or BETTER	
v/c	All movements < 1.0 (<= 0.93 preferred)	
QSR	All movements <1.0 from HCS analysis, TransModeler may be needed to determine if queuing impacts upstream intersections.	

**MPO = Metropolitan Planning Organization**  
**v/c = Volume to Capacity Ratio**  
**QSR = Queue Storage Ratio**

The city of North Ridgeville is located within the boundaries of the Northeast Ohio Areawide Coordinating Agency (NOACA) metropolitan planning organization (MPO). It will be determined from the capacity analyses if there are any locations, approaches or movements in which the delay, v/c, and/or QSR exceed the operational goals shown in *Table 1.2* for a location inside an MPO.

All intersections will be analyzed using the computerized version of the Transportation Research Board’s **Highway Capacity Manual 7<sup>TH</sup> Edition** <sup>(1)</sup>, (**HCS2025, Release 8.4**). The capacity analyses for signalized intersections will be based on the process detailed in *Section 6.2.2.1* of the ODOT **OATS Manual** <sup>(6)</sup>. The optimization of any traffic signal timings will be based on the delay minimization function with the objective of Balanced Delay.

It should be noted that any values for queue length, shown in the HCS analysis summary sheets that are displayed in red, indicate that the movement is expected to experience a “spillback” condition where the queue may exceed the existing length of the turn lane and extend into the adjacent through lane. These instances, if they occur, will be investigated for mitigation.

## 1.4 Intersection Turn Lanes

### Turn Lane Warrants

The ODOT **Location and Design Manual, Volume 1** <sup>(3)</sup> and the **State Highway Access Management Manual** <sup>(7)</sup> describes the need for auxiliary turn lanes at unsignalized intersections. *Section 401.6.3* of the ODOT **Location and Design Manual** <sup>(4)</sup> states that:

*“To determine the number and use of left (right) turn lanes, intersection capacity analysis procedures of the current edition of the Highway Capacity Manual should be used. For unsignalized intersections, left (right) turn lanes may also be needed if they meet warrants provided in Figures 401-5(6)a, b, c and d. The warrants apply only to the free-flow approach of the unsignalized intersection.”*

The Auxiliary Lane Graphs found in *Section 401-6* of the **Location and Design Manual, Volume 1** <sup>(4)</sup> are used for this determination. This applies to the free-flow approaches at unsignalized intersections.

*Section 401-6* of the **Location and Design Manual, Volume 1** <sup>(4)</sup> specifies the current edition of the **Highway Capacity Manual** <sup>(1)</sup> should be used for signalized intersections.

It is the intent of this report to evaluate the need for exclusive deceleration and turn lanes at the development access location on Cook Road.

## Turn Lane Length

Existing turn lanes found to be deficient per the QSR results from the capacity analysis and any recommended turn lanes will be analyzed to determine the necessary storage length in accordance with the procedure found in the Ohio Department of Transportation's **Location and Design Manual, Volume 1** <sup>(3)</sup>, *Section 401*. The ODOT criteria and procedures are furnished in **Appendix B**.

The ODOT **Location and Design Manual** <sup>(4)</sup> provides the following guidance regarding maximum and minimum turn lane lengths:

- *"It is recommended that left turn lanes be at least 100 feet long, and the maximum storage length be no more than 600 feet."*
- *"The recommended maximum length of right turn lanes at signalized intersections is 800 feet, with 100 feet being the minimum length."*

## Design Speed

The procedure for determining the necessary turn lane storage length found in the Ohio Department of Transportation's **Location and Design Manual, Volume 1** <sup>(3)</sup>, *Section 401*, is in part based on the design speed of the roadway.

The AASHTO publication, **A Policy on Geometric Design of Highway Streets (Green Book)** <sup>(11)</sup>, defines design speed as a selected speed used to determine the various geometric design features of the roadway. The assumed design speed should be a logical one with respect to the topography, anticipated operating speed, the adjacent land use and the functional classification of highway.

The ODOT **Location and Design Manual, Volume 1** <sup>(3)</sup> provides guidance for determining the design speed of a roadway. *Section 104.2* of the ODOT **Location and Design Manual** <sup>(3)</sup> states that:

*"The design speed should be at least the legal speed for facilities with a legal speed of 35 mph or less. For facilities with a legal speed of 40 or 45 mph the design speed shall either match the legal speed, or be 5 mph greater than the legal speed, depending on the context of the area. For facilities with a legal speed 50 mph or greater, the design speed shall be 5 mph greater than the legal speed."*

## 1.5 References

The following list of references will be utilized for this report and the analysis contained within it:

1. *Highway Capacity Manual*, 7<sup>th</sup> Edition. Transportation Research Board of the National Academies, Washington, D.C.
2. *Ohio Manual of Uniform Traffic Control Devices for Streets and Highways*, 2012 Edition. Ohio Department of Transportation, Office of Traffic Engineering, Columbus, Ohio.
3. *Location and Design Manual*, Volume 1, Roadway Design. Ohio Department of Transportation, Office of Roadway Engineering, Columbus, Ohio.
4. *Ohio Traffic Forecasting Manual*, Volume 1, Traffic Forecasting Background. Ohio Department of Transportation, Office of Statewide Planning & Research, Columbus, Ohio.
5. *Ohio Traffic Forecasting Manual*, Volume 2, Traffic Forecasting Methodologies. Ohio Department of Transportation, Office of Statewide Planning & Research, Columbus, Ohio.
6. *ODOT Analysis and Traffic Simulation Manual (OATS)*, Ohio Department of Transportation, Office of Roadway Engineering, Columbus, Ohio.
7. *State Highway Access Management Manual*, Ohio Department of Transportation, Office of Roadway Engineering, Columbus, Ohio.
8. *Trip Generation Manual*, 11<sup>th</sup> Edition, September 2021, Institute of Transportation Engineers, (ITE), Washington, D.C.
9. *Trip Generation Handbook*, 3<sup>rd</sup> Edition, September 2017, Institute of Transportation Engineers, (ITE), Washington, D.C.
10. *Traffic Engineering Manual*, October 23, 2002 Edition (Revised January 15, 2021), Ohio Department of Transportation, Office of Roadway Engineering, Columbus, Ohio.
11. *Highway Functional Classification Concepts, Criteria and Procedures*, 2013 Edition, Federal Highway Administration.

## Chapter 2

### Area Conditions

#### 2.1 Transportation Network Study Area

The study area that will be analyzed for the proposed development includes the following intersections:

1. **Lorain Road & Cook Road / Lear Nagle Road**
2. **Cook Road & Starbucks Driveway**

These intersections will be enumerated and referenced as listed above throughout the report and the analyses contained within it. An aerial view of the of the study area can be seen in **Figure 2.1 Appendix A**.

The following section details the lane use and traffic control for the intersections under study for this report.

#### Roadway & Intersection Characteristics

The following section details the lane use and traffic control for the intersections within the study area for this report.

Lorain Road has a northeast / southwest orientation. Lorain Road will be considered to have a eastbound / westbound orientation for this report and all analysis within it .

#### 1. Lorain Road & Cook Road / Lear Nagle Road

##### **Lorain Road West Approach**

- 1 Exclusive Left Turn Lane
- 1 Exclusive Through Lane
- 1 Shared Through / Right Turn Lane

##### **Lorain Road East Approach**

- 1 Exclusive Left Turn Lane
- 2 Exclusive Through Lanes
- 1 Exclusive Right Turn Lane

##### **Lear Nagle Road North Approach**

- 2 Exclusive Left Turn Lanes
- 1 Shared Through / Right Turn Lane

##### **Cook Road South Approach**

- 1 Exclusive Left Turn Lane
- 1 Shared Through / Right Turn Lane

The intersection is controlled by a traffic signal. The signal sequence can operate with eight (8) “phases” which assign the right-of-way to specific movements and displays yellow and all-red clearances. The first two phases are all eastbound and westbound left turn movements with the turn movement made during the green arrow indication (protected movement). The next two phases are all eastbound and westbound movements where the left turn movements are made during a green ball indication when there is a gap in the opposing through traffic movements (permissive movement). The next two signal phases are all northbound and southbound left turn movements with the turn movement made during the green arrow indication (protected movement). The next two phases are all northbound and southbound movements where the left turn movements are made during a green ball indication when there is a gap in the opposing through traffic movements (permissive movement). During the southbound protected left turn movement there is a westbound right turn overlap.

A copy of the existing intersection signal timing can be found in **Appendix C**.

## **2. Cook Road & Starbucks Driveway**

### **Cook Road West Approach**

-1 Shared Through / Right Turn Lane

### **Cook Road East Approach**

-1 Exclusive Left Turn Lane

-1 Exclusive Through Lane

### **Starbucks Driveway South Approach**

-1 Shared Left / Right Turn Lane

The intersection functions as a one-way stop controlled intersection. The Cook Road approaches operate under free-flow conditions with the westbound left turn movement yielding to the opposing eastbound through and right turn movements.

**Figure 2.2, Appendix A** shows the existing lane use and traffic control conditions in the study area. These will be considered the existing base conditions for this report.

The following table details and summarizes the primary characteristics of the study area intersections and roadways:

**Table 2.1 Roadway Characteristics**

INTERSECTION		APPROACH	LANE USE		SPEED LIMIT	TRAFFIC CONTROL
#	ROADWAYS		THROUGH & SHARED LANES	TURN LANES		
1	Lorain Road	East	2	1 LT, 1 RT	35	Traffic Signal
	Lorain Road	West	2	1 LT	35	
	Cook Road	South	1	1 LT	35	
	Lear Nagle Road	North	1	2 LT	35	
2	Cook Road	East	1	1 LT	35	One-Way Stop Controlled
	Cook Road	West	1	-	35	
	Starbucks Driveway	West	1*	-	NP	

**\*Shared Left/Right Turn Lane  
NP-Not Posted**

## 2.2 Functional Classification

The Ohio Department of Transportation functionally classifies roadways to help define a roadway's characteristics as well as identify roadways that are eligible for federal funds. Functional classification is the grouping of roads, streets, and highways in a hierarchy based on the type of highway service they provide. Generally, streets and highways perform two types of service. They provide either traffic mobility or land access and can be ranked in terms of the proportion of service they provide.

The functional classification as determined by ODOT will be used in this report to apply growth and design hour factors to the study area roadways for use in forecasting the future traffic volumes in the study area. These factors are determined using data, guidelines, and methodology supplied by ODOT. The methods and the corresponding data are based on the roadways assigned functional classification. The ODOT methods for forecasting future traffic volumes are a recognized traffic engineering standard in the State of Ohio.

Roadways that are not listed as having a functional classification can be assigned into one of two categories. The first category is a local roadway and the second category is that of an access drive.

The roadway functional classifications are assigned either an urban or rural designation.

The ODOT the urban/rural designation and functional classification of the roadways in the study area can currently be found using the ODOT Transportation Information Mapping System (TIMS). TIMS is ODOT's web-mapping portal where information about Ohio's transportation system can be found. TIMS can currently be found at the following web address:

<https://gis.dot.state.oh.us/tims/>

The urban and rural designation for the study area roadways can be found under the Boundaries tab and the selection of the "Census Urban Areas" layer.

The roadway functional classification can be found under the Roadway Information tab and the selection of the "Functional Classification" layer.

The following table lists the study area roadways that have an assigned functional classification as determined by ODOT and local government entities.

**Table 2.2 Functional Classification**

INTERSECTION		AREA	FC#	CLASSIFICATION
#	ROADWAYS			
1	Lorain Road	Urban	4	Minor Arterial
	Lear Nagle Road		5	Major Collector
	Cook Road		5	Major Collector
2	Cook Road	Urban	5	Major Collector
	Starbucks Driveway		7	Local Access

**Figure 2.3, Appendix A** illustrates the section of the functional classification map for the study area. The map was created using the ODOT Transportation Information Mapping System (TIMS) web-mapping portal.

## 2.3 Traffic

### Weekday Peak Hours

Weekday nine hour turning movement counts were performed on the listed dates at the following locations:

1. **Lorain Road & Cook Road / Lear Nagle Road (01-29-2025)**
2. **Cook Road & Starbucks Driveway (01-30-2025)**

The 2025 weekday traffic count was conducted in fifteen (15) minute intervals between the hours of 7 AM - 10 AM, 11 AM - 2 PM, and 3 PM - 6 PM, then hourly totals were calculated. Average daily traffic was calculated for the roadways using expansion factors to account for daily and seasonal variations according to the recommendations and latest data from the Ohio Department of Transportation. Copies of the intersection turn movement counts are included in **Appendix D**.

This Panda Express restaurant will not be open during breakfast hours, therefore a Mid-day peak hour will be used in place of an AM peak hour for this study.

The Mid-day and PM intersection peak hours are selected by reviewing data in 15-minute intervals. When there is more than one intersection within the study area, a consistent time period should be used for all intersections within the study area in order to develop an existing conditions traffic volume set, the system peak hour.

The following questions should be considered when choosing the peak hours for a study area with multiple intersections:

- What are the individual intersection peak hours?
- Are the individual peak hours the same time or close to each other?
- Would it result in significantly fewer vehicles to use a different peak hour for intersections that are not the same?
- What is the peak hour for intersections with the highest overall volume?
- What peak hour contributes the highest volume to the entire system?

Summaries tables which illustrate the entering traffic volumes during the Mid-day and PM time periods are used to evaluate the previously discussed questions, to identify the peak hours for each intersection, and to determine the peak hour of the system.

The following tables detail a breakdown of the hourly volumes during the Mid-day and PM hours that were determined to experience the highest traffic volumes at the study area intersections. The data shown in the tables will be used in the determination of the Mid-day and PM peak hours for the study area intersections.

**Table 2.3 Mid-day Peak Hour Traffic Volumes  
(Total Entering Volume - Vehicles per Hour)**

INTERSECTION	HOUR BEGINS								
	11:00	11:15	11:30	11:45	12:00	12:15	12:30	12:45	1:00
1	1515	1647	1744	1943	1883	1857	1795	1748	1682
2	521	553	602	631	642	620	587	589	594
<b>TOTAL</b>	2036	2200	2346	2574	2525	2477	2382	2337	2276

**Table 2.4 PM Peak Hour Traffic Volumes  
(Total Entering Volume - Vehicles per Hour)**

INTERSECTION	HOUR BEGINS								
	3:00	3:15	3:30	3:45	4:00	4:15	4:30	4:45	5:00
1	2258	2329	2350	2582	2833	2991	3064	2921	2696
2	682	744	785	775	800	786	815	815	773
<b>TOTAL</b>	2940	3073	3135	3357	3633	3777	3879	3736	3469

The peak hours for the study area were determined based on the Mid-day and PM hour experiencing the highest total volumes. The weekday Mid-day peak hour of traffic was determined to be 11:45 AM to 12:45 PM. The weekday PM peak hour of traffic was found to be 4:30 PM to 5:30 PM. These periods will be used to forecast expected and future traffic volumes since they reflect the period of the highest volume of vehicular traffic flow for the study area roadways.

The existing weekday Mid-day and PM peak hour traffic volumes are shown in **Figure 2.4, Appendix A**.

# Chapter 3

## Projected Traffic Conditions

### 3.1 Site Traffic

#### Trip Generation

Calculating future total driveway trips requires an estimate of the traffic generated by the proposed development. The most widely accepted method of determining the amount of traffic that the proposed development will generate is to compare the proposed land use with existing facilities of the same use. The Institute of Transportation Engineers (ITE) has prepared a manual titled “**Trip Generation Manual**” <sup>(8)</sup>, which is a compilation of similar traffic generation studies to aide in making such a comparison. The most recent update of this manual is the 11<sup>TH</sup> edition and was utilized for this study.

The development is expected to consist of a 2,700 square foot restaurant.

The following table details the development land use from the site plan (**Figure 1.2**) and the corresponding **Trip Generation Manual** <sup>(8)</sup> land use that will be used to forecast the site generated traffic volumes for the Build conditions:

**Table 3.1 ITE Land Use Code**

SITE PLAN	SIZE	ITE CODE	ITE DESCRIPTION
Panda Express	2,700 SF	934	Fast Food Restaurant with Drive-Through Window

The Institute of Transportation Engineers (ITE) provides a web-based application (**ITETripGen**) that will be used to calculate the expected future driveway trips using the data from the **Trip Generation Manual** <sup>(8)</sup>. The **ITETripGen** web-based app can be accessed through a subscription at the following address:

<https://itetripgen.org/>

An independent variable is used in trip generation calculations, which consists of a physical, measurable and predictable characteristic that describes the study site. This has a direct relationship to the variation in the number of trips generated by the land use. For a fast food restaurant with drive-through window, the gross floor area will be used. The gross floor area variable is entered to a precision of two decimal places when using the **ITETripGen** web-based app to calculate the number of driveway trips. For the purpose of this report the independent variable generating a higher volume of site generated trips will be used in the forecasting of the future study area traffic volumes.

Vehicle trips generated by a site can be separated into two major categories: non pass-by trips and pass-by trips. Non-pass-by trips can be further subdivided into primary trips and diverted trips. Pass-by and diverted trips may be part of a multiple-stop chain of trips.

A **pass-by trip** is made as an intermediate stop on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the generator (i.e. motorists who are already on the road and stop to get food on their way to work from home).

A **non-pass-by trip** is simply any trip generated by a site that is not a pass-by trip. Non-pass-by trips are sometimes used when diverted trips are not calculated separately from primary trips in the analysis process.

A **diverted trip** is attracted from the traffic volume on roadways within the vicinity of the generator but without direct access to the site. A diverted trip requires a diversion from a roadway not adjacent to the site to another roadway to gain direct access to the site (i.e. motorists who are on the interstate and exit to get something to eat and then re-enter the interstate).

A **primary trip** is made for the specific purpose of visiting the generator. The stop at the generator is the primary reason for the trip.

The site generated traffic for the proposed development will be categorized as pass-by and non-pass-by trips for the purpose of this report and all analysis contained within.

The ITE **Trip Generation Manual** <sup>(8)</sup> provides PM peak hour pass-by trip data for land use #934 - Fast Food Restaurant with Drive-Through Window. It does not provide data for Mid-day peak hours. Therefore no pass-by rate will be used for the Mid-day peak hour generated trips. The average pass-by percentages will be used to provide a conservative estimate of the site generated pass-by traffic. Copies of the ITE **Trip Generation Manual** <sup>(8)</sup> pass-by rate tables used in this report are provided in **Appendix E**.

The following tables details the PM peak hour pass-by trip rates that will be used in the forecasting of the expected site generated traffic volumes:

**Table 3.2 Peak Hour Pass-by Trip Rates**

ITE LAND USE DESCRIPTION	ITE CODE	PEAK HOUR	PASS-BY RATES		
			LOWEST	HIGHEST	AVERAGE
Fast Food Restaurant with Drive-Through Window	934	PM	31%	71%	55%

**Trip Generation Summary**

Trip generation calculations for the development were performed utilizing data contained in the **Trip Generation Manual** <sup>(8)</sup> and the methods outlined in the **Trip Generation Handbook** <sup>(9)</sup> including the application of pass-by rates. The following table details the expected generated weekday peak hour traffic volumes based on the gross floor area as the independent variable. Copies of the trip generation worksheets can be found in **Appendix E**.

**Table 3.3 Trip Generation Summary**

ITE TRIP GENERATION			WEEKDAY TRIP ENDS			
ITE CODE	DESCRIPTION	SIZE	Mid-day Peak Hour of Generator (AM values) (Enter/Exit)		PM Peak Hour of Generator (Enter/Exit)	
934	Fast Food Restaurant with Drive-through Window	2,700 SF	71	66	70	68
Pass-by Trips (Mid-day Not Available, PM 55%)			-	-	-37	-37
<b>TOTAL NON-PASS-BY TRIPS</b>			<b>71</b>	<b>66</b>	<b>33</b>	<b>31</b>
			<b>137</b>		<b>64</b>	

**Distribution of Non-Pass-by Generated Traffic**

The directional distribution for the non-pass-by generated traffic is a function of the prevailing operating conditions on the existing roadways. The distribution pattern that was assumed is shown in the tables that follow and is based upon the existing traffic volumes entering and exiting the study area at the intersection of Lorain Road and Cook Road / Lear Nagle Road during the Mid-day and PM peak hours shown in **Figure 2.4, Appendix A**.

The following tables detail the distribution of the site generated non-pass-by trips for the proposed development land use under the opening and design year conditions.

**Table 3.4 Mid-day Non-Pass-By Trip Origins and Destinations**

ORIGIN/ DESTINATION	ROUTE	FROM (ENTER)	%* TOTAL	TRIPS*	TO (EXIT)	%* TOTAL	TRIPS*
North	Lear Nagle Road	599	30.8%	22	558	28.7%	19
South	Cook Road	298	15.3%	11	248	12.8%	8
East	Lorain Road	553	28.5%	20	641	33.0%	22
West	Lorain Road	493	25.4%	18	496	25.5%	17
<b>TOTALS</b>		<b>1943</b>	<b>100.0%</b>	<b>71</b>	<b>1943</b>	<b>100.0%</b>	<b>66</b>

\* Rounded

**Table 3.5 PM Non-Pass-By Origins and Destinations**

ORIGIN/ DESTINATION	ROUTE	FROM (ENTER)	%* TOTAL	TRIPS*	TO (EXIT)	%* TOTAL	TRIPS*
North	Lear Nagle Road	775	25.3%	9	1129	36.9%	11
South	Cook Road	401	13.1%	4	372	12.1%	4
East	Lorain Road	1145	37.4%	12	821	26.8%	8
West	Lorain Road	743	24.2%	8	742	24.2%	8
<b>TOTALS</b>		<b>3064</b>	<b>100.0%</b>	<b>33</b>	<b>3064</b>	<b>100.0%</b>	<b>31</b>

\* Rounded

**Distribution of Pass-by Generated Traffic**

The directional distribution for the pass-by generated traffic is a function of the prevailing operating conditions on the existing roadways. The distribution pattern that was assumed is shown in the tables that follow and is based upon the existing through traffic volumes at the intersection of Cook Road and Starbucks Driveway during the PM peak hour shown in **Figure 2.4, Appendix A**.

The following tables detail the distribution of the site generated pass-by trips for the proposed development land use under the opening and design year conditions.

**Table 3.6 PM Pass-By Origins and Destinations**

ORIGIN/ DESTINATION	ROUTE	FROM (ENTER)	%* TOTAL	TRIPS*	TO (EXIT)	%* TOTAL	TRIPS*
East	Cook Road	384	51.5%	19	361	48.5%	18
West	Cook Road	361	48.5%	18	384	51.5%	19
<b>TOTALS</b>		<b>745</b>	<b>100.0%</b>	<b>37</b>	<b>745</b>	<b>100.0%</b>	<b>37</b>

### **Directional Distribution of Site Generated Non-Pass-By Traffic**

The directional distribution for the non-pass-by Mid-day and PM peak hour generated traffic is shown graphically in **Figure 3.1, Appendix A** for the proposed development.

### **Directional Distribution of Site Generated Pass-By Traffic**

The directional distribution for the pass-by PM peak hour generated traffic is shown graphically in **Figure 3.2, Appendix A** for the proposed development.

### **Assignment of Non-Pass-By Site Generated Traffic**

Based upon the distribution pattern shown in **Figure 3.1, Appendix A**, the non-pass-by Mid-day and PM peak site generated traffic was assigned to the study intersections for the proposed development. The assignment of the estimated site generated non-pass-by traffic for the opening and design year conditions is shown graphically in **Figure 3.3, Appendix A**.

### **Assignment of Pass-By Site Generated Traffic**

Based upon the distribution pattern shown in **Figure 3.2, Appendix A**, the PM peak site generated pass-by traffic was assigned to the study intersections for the proposed development. The assignment of the estimated site generated pass-by traffic for the opening and design year conditions is shown graphically in **Figure 3.4, Appendix A**.

### **Total Site Generated Traffic**

The total site generated traffic was found by adding together the estimated site generated non-pass-by and pass-by trips shown in **Figures 3.3 and 3.4, Appendix A**. The total site generated traffic is shown in **Figure 3.5, Appendix A**.

## 3.2 Non-Site Traffic

### Background Traffic Growth

Design of new roadways or improvements to existing roadways should not usually be based on current traffic volumes alone, but should consider future traffic volumes expected to make use of the facilities. Roadways should be designed to accommodate the traffic volume that is likely to occur within the design life of the facility. In a practical sense, this design volume should be a value that can be estimated with reasonable accuracy. It is believed that the maximum design period is in the range of 15 to 24 years. Traffic cannot usually be forecasted accurately beyond this period on a specific facility because of probable changes in the general regional economy, population, and land development along the roadway.

The ODOT **State Highway Access Management Manual** <sup>(7)</sup> requires that ten year design hour traffic volumes be analyzed for a proposed development when the number of generated trips is below 500 in the peak hour and twenty year design hour traffic volumes when the number of generated trips is greater than 500 in the peak hour.

The years 2026 (Opening Year) and 2036 (Design Year) will be analyzed for the proposed development as the peak hour site generated traffic volumes are less than 500 trips. Therefore, it is necessary to estimate historical growth rates in order to establish the future traffic on the study area roadways due to non-site related conditions.

Roadways like Lorain Road, Cook Road, and Lear Nagle Road carry a significant amount of through traffic due to their functional characteristics. This through traffic component generally increases as regional growth occurs. Therefore, it is anticipated that existing traffic on these roadways will increase in future years.

The Starbucks Driveway is classified as local access drive. The Ohio Department of Transportation, in their document **ODOT Highway Functional Classification System Concepts, Procedures and Instructions** <sup>(11)</sup>, has identified the following characteristics for access drives:

- Provide direct access to adjacent land & to higher systems
- Carry no through traffic movement
- Constitute the mileage not classified as part of the Arterial and Collector systems

The ODOT Traffic Monitoring Management System (TMMS) was consulted to determine past historical trends on the study area roadways. The ODOT Traffic Monitoring Management System (TMMS) can be currently accessed at the following web address:

<http://www.dot.state.oh.us/Divisions/Planning/TechServ/traffic/Pages/TMMS.aspx>

The procedure detailed in *Section 4.2* of the **Ohio Traffic Forecasting Manual, Volume 2** <sup>(5)</sup> recommends at least five separate years of collected traffic data be available in order to calculate a growth rate. The TMMS provided data at the following location that was suitable to determine a study area growth rate:

**1. Lorain Road (Northeast of Ohio Turnpike) - Location ID 7147**

A linear regression equation was developed for this location based on the available historical data. The growth rate for this location was then calculated based on the procedure detailed in *Section 4.2* of the **Ohio Traffic Forecasting Manual, Volume 2** <sup>(5)</sup>. A copy of the ODOT historical traffic data analysis and the growth rate calculations can be seen in **Appendix F**.

A positive growth rate of 0.5991%. This growth rate will be used in the forecast of future traffic conditions based on the historical traffic data and the functional classification of the study area roadways in order to provide a conservative forecast for the study area.

The growth rate and factors for study area can be seen in the following table:

**Table 3.7 - Growth Rate & Factors**

GROWTH RATE (Annual Growth)	2026 GROWTH FACTOR*	2036 GROWTH FACTOR*
0.5991%	1.006	1.066

\* Rounded

The Starbucks Driveway will not have a growth rate applied to the existing traffic volumes as it is intended to provide access. This will also apply to turn movements from Cook Road to the driveway.

## Design Hour Traffic

The traffic patterns on any roadway typically show considerable variation in the traffic volumes experienced during the various hours of the day and in the hourly volumes experienced throughout the year. A key decision in the design process involves determining which of these hourly traffic volumes should be used as the basis for the design.

It would be wasteful to predicate a design on the maximum peak hour traffic that occurs during the year and the use of the average hourly traffic would result in an inadequate design. The hourly traffic volumes used in a design should not be exceeded very often or by very much. However, the hourly traffic volumes should not be so high that traffic would rarely be sufficient to make full use of the designed facility.

Normal design policy in the State of Ohio is based upon a review of curves that depict the variation in hourly traffic volumes during the year. The Ohio Department of Transportation recommends using the 30<sup>TH</sup> highest hour as a design control for urban streets. There is typically very little difference between the volumes in this range. The Ohio Department of Transportation provides factors or a methodology to determine factors that are applied to counted daily traffic volumes to determine appropriate design hour traffic volumes.

All analyses will examine the design hour volume for the adjacent roadway and peak hour traffic volume of the proposed development following guidelines set forth in the ODOT **State Highway Access Management Manual** <sup>(7)</sup>. The **Ohio Traffic Forecasting Manual** <sup>(4&5)</sup> will be used to determine peak hour factors for the study area roadways.

The design hour volumes are determined by multiplying the Mid-day and PM peak hour volumes by the appropriate factors from the ODOT Peak Hour to Design Hour Factor Report based on the functional classification of the roadway, the day of the week and the month that the traffic data was collected. A copy of the ODOT's Peak Hour to Design Hour Factor Report can be seen in **Appendix G**.

The following table details the peak hour to design hour factors for the study area roadways.

**Table 3.8 - Peak Hour to Design Hour Factors**

INTERSECTION	ROADWAYS	MONTH	DAY	URBAN CLASSIFICATION	DHV FACTOR*
1	Lorain Rd.	January	Wed.	Minor Arterial	1.25
	Lear Nagle Rd.	January	Wed.	Major Collector	1.25
	Cook Rd.	January	Wed.	Major Collector	1.25
2	Lorain Rd.	January	Thu.	Minor Arterial	1.23
	Starbucks DW	January	Thu.	Local Access	1.0

\* Rounded

The peak hour to design hour factors detailed in *Table 3.8* will be used in the forthcoming future traffic volume calculations in *Chapter 3, Section 3.3* of this report.

**Peak Hour Factors**

The intersection peak hour factor (PHF) is used to convert the hourly traffic volume into the flow rate that represents the busiest 15 minutes of the peak hour. The PHF is the sum of the traffic entering the intersection during the peak hour divided by four times the highest 15 minute volume during the peak hour. A PHF of 1 indicates that the traffic volume in each 15 minute volume is the same and therefore traffic flow is consistent throughout the hour. A lower PHF indicates a more variable traffic flow and that traffic volume has a spike during the peak 15 minute interval. PHF’s under 0.80 occur in locations with highly peaked demand, such as at schools and factories during shift changes.

The ODOT **Analysis and Traffic Simulation Manual, (OATS)**<sup>(6)</sup> provides guidance to use the existing year PHF for all intersections from traffic counts collected for the project. The PHF is calculated for the intersection as a whole and not individual approaches or movements. A minimum of 0.80 for the PHF is required to be utilized unless justified by highly peaked demands such as for schools and factories noted above. If project specific counts are not available, a default value of 0.92 is to be utilized.

It is assumed for this report that the PHF for the design year analysis are the same as the calculated PHF from the collected existing year traffic counts. The intersection PHF’s are included in **Appendix D**.

The following table shows the PHF’s calculated for the study area intersection during the Mid-day and PM peak hours:

**Table 3.9 - Intersection Peak Hour Factors**

ROADWAY/INTERSECTION	Mid-day PHF	PM PHF
Lorain Road & Cook Road / Lear Nagle Road	0.94	0.96
Cook Road & Starbucks Driveway	0.92	0.91

The peak hour factors detailed in *Table 3.9* will be used in the forthcoming intersection capacity calculations in *Chapter 4* of this report.

### 3.3 Future Traffic

#### No-Build Conditions

The previously discussed peak hour to design hour factors and growth factors for each movement were applied to the traffic volumes shown in **Figure 2.4** in order to estimate the future traffic considering non-project traffic conditions. This condition will be referred to as the “**No-Build**” condition as it will reference the calculated future study area volumes **without** the development of the Panda Express at the site.

Printouts of our Excel spreadsheet detailing the use of the design hour factors, growth rates and the resulting expected 2026 and 2036 No-Build traffic volumes can be found in **Appendix H**.

The peak hour traffic volumes previously detailed in **Figure 2.4, Appendix A** and shown in **Appendix H** were determined to have variations between the adjacent count locations. The volume difference between intersections should be zero as there are no intersecting roadways or driveways to gain or lose vehicles.

The volumes between the study area intersections were “balanced” using a combination of the “methods described in *Section 2.6.3 of ODOT's Ohio Traffic Forecasting Manual, Volume 2*<sup>(5)</sup> in order to eliminate the difference in volumes. The Cook Road through volumes at the Starbucks Driveway intersection were determined based on the northbound volume entering and the southbound volume leaving the Lorain Road and Cook Road / Lear Nagle Road intersection. The turning movements at the Starbucks Driveway intersection were not adjusted.

The estimated 2026 and 2036 No-Build traffic volumes for the study area are shown graphically in **Figures 3.6 and 3.7, Appendix A**. This traffic is the expected traffic if proposed development **is not** constructed, the “**No-Build**” condition.

The No-Build traffic volumes have been rounded to the nearest 10 to adhere to preferred ODOT practices.

## Build Condition

The 2026 No-Build volumes, shown in **Figure 3.6, Appendix A**, were added to the total site generated traffic (**Figure 3.5, Appendix A**) to equal the future Build peak hour volumes in order to estimate the future opening year traffic considering project traffic conditions.

The estimated 2026 Build traffic volumes for the study area are shown graphically in **Figure 3.8, Appendix A**. These traffic volumes are the expected volumes if the proposed development is constructed the “**Build**” condition.

The 2036 No-Build volumes, shown in **Figure 3.7, Appendix A**, were added to the total site generated traffic (**Figure 3.5, Appendix A**) to equal the future Build peak hour volumes in order to estimate the future design year traffic considering project traffic conditions.

The estimated 2036 Build traffic volumes for the study area are shown graphically in **Figure 3.9, Appendix A**. These traffic volumes are the expected volumes if the proposed development is constructed the “**Build**” condition.

## Chapter 4

### Traffic Analysis

#### 4.1 Capacity & LOS at Study Area Intersection

##### 2026 Traffic Analysis - No-Build & Build Conditions

Traffic analyses were performed for the projected 2026 conditions under the No-Build and Build scenarios so:

1. any existing roadway/intersection deficiencies can be identified in the No-Build scenario which would not be attributable to the development, and;
2. a comparison can be made to determine the changes in the traffic operations which may be attributed to the development.

The traffic volumes used in the 2026 No-Build analyses can be seen in **Figure 3.6, Appendix A**. Copies of the capacity worksheets for the 2026 No-Build analyses are included in **Appendix I**.

The traffic volumes used in the 2026 Build analyses can be seen in **Figure 3.8, Appendix A**. Copies of the capacity worksheets for the 2026 Build analyses are included in **Appendix J**.

**1. Lorain Road & Cook Road / Lear Nagle Road**

The peak hour traffic analysis results of the 2026 No-Build versus Build conditions for the signalized intersection of Lorain Road and Cook Road / Lear Nagle Road is shown in the following tables:

**Table 4.1 - 2026 Mid-day Peak Hour Traffic Analysis Comparison  
(Lorain Road & Cook Road / Lear Nagle Road)**

Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2026 Mid-Day (Signal, 110s) No-Build					Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2026 Mid-Day (Signal, 110s) Build				
	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)		LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)
EBL	B	17.6	0.442	0.30	145	EBL	B	19.4	0.464	0.31	152
EBT	C	22.0	0.284	0.15	152	EBT	C	24.6	0.320	0.17	167
EBR	C	22.1	0.289	0.15	142	EBR	C	24.8	0.327	0.16	155
EB Approach	C	20.4	-	-	-	EB Approach	C	22.8	-	-	-
WBL	B	19.3	0.158	0.21	52	WBL	C	21.4	0.219	0.29	72
WBT	C	24.9	0.263	0.13	128	WBT	C	27.4	0.286	0.13	134
WBR	B	15.3	0.271	0.24	128	WBR	B	17.3	0.287	0.25	136
WB Approach	C	20.9	-	-	-	WB Approach	C	23.1	-	-	-
NBL	D	37.7	0.612	0.79	135	NBL	D	36.7	0.636	0.86	146
NBT	D	47.1	0.851	0.24	244	NBT	D	45.7	0.870	0.28	278
NB Approach	D	43.7	-	-	-	NB Approach	D	42.5	-	-	-
SBL	D	46.4	0.844	0.43	221	SBL	D	46.4	0.844	0.43	221
SBT	D	42.1	0.857	0.31	314	SBT	D	39.9	0.833	0.33	325
SB Approach	D	44.5	-	-	-	SB Approach	D	43.5	-	-	-
<b>Intersection</b>	<b>C</b>	<b>32.0</b>	-	-	-	<b>Intersection</b>	<b>C</b>	<b>32.8</b>	-	-	-

**Table 4.2 - 2026 PM Peak Hour Traffic Analysis Comparison  
(Lorain Road & Cook Road / Lear Nagle Road)**

Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2026 PM (Signal, 120s) No-Build					Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2026 PM (Signal, 120s) Build				
	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)		LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)
EBL	D	42.9	0.845	0.61	297	EBL	D	52.1	0.884	0.43	211
EBT	C	33.5	0.490	0.27	266	EBT	D	35.6	0.520	0.28	278
EBR	C	33.8	0.494	0.25	249	EBR	D	35.9	0.525	0.26	260
EB Approach	D	37.1	-	-	-	EB Approach	D	41.7	-	-	-
WBL	C	27.6	0.395	0.44	111	WBL	C	27.8	0.444	0.48	119
WBT	D	37.5	0.520	0.24	240	WBT	D	37.5	0.520	0.24	240
WBR	E	64.8	0.996	1.49	806	WBR	E	64.8	0.996	1.49	806
WB Approach	D	50.7	-	-	-	WB Approach	D	50.5	-	-	-
NBL	D	38.2	0.664	0.79	134	NBL	D	38.2	0.676	0.82	140
NBT	E	60.2	0.905	0.42	416	NBT	E	61.6	0.912	0.44	442
NB Approach	D	54.2	-	-	-	NB Approach	E	55.2	-	-	-
SBL	D	52.7	0.871	0.51	267	SBL	D	52.7	0.871	0.51	267
SBT	D	53.9	0.914	0.52	520	SBT	D	53.0	0.907	0.53	525
SB Approach	D	53.3	-	-	-	SB Approach	D	52.9	-	-	-
<b>Intersection</b>	<b>D</b>	<b>48.5</b>	-	-	-	<b>Intersection</b>	<b>D</b>	<b>49.6</b>	-	-	-

It was determined that conditions at the intersection of Lorain Road and Cook Road / Lear Nagle Road during the Mid-day and PM peak hours will operate with level-of-service E or better under the forecasted 2026 No-Build and Build conditions.

The Mid-day and PM peak hour comparison tables indicate that the movement, approach, and intersection LOS remain unchanged from the No-Build to the Build condition with the exception of the following:

- Westbound left turn movement degrades from a LOS B to a LOS C in the Mid-day peak hour.
- Eastbound through and right turn movements degrade from a LOS C to a LOS D in the PM peak hour.
- Northbound approach degrades from a LOS D to a LOS E in the PM peak hour.

The 2026 Mid-day and PM peak hour comparison tables for the intersection of Lorain Road and Cook Road / Lear Nagle Road shown previously, indicate that the levels-of-service are within the acceptable range shown in *Table 1.2, Page 4* as stated in the **ODOT OATS Manual** <sup>(6)</sup>.

A QSR greater than 1.0 indicates the storage length of the lane may not be adequate for the forecasted conditions. The QSR of the following lanes are greater than 1.0 in both the No-Build and Build condition in the PM peak hour:

- Westbound right turn lane.

An analysis will be performed in a later section of this report to determine the queue length needed to mitigate the effect or any other improvement that could reduce the queue storage length for westbound right turn lane.

**2. Cook Road and Starbucks Driveway**

The peak hour traffic analysis results of the 2026 No-Build versus Build conditions for the stop controlled intersection of Cook Road and Starbucks Driveway are shown in the following tables:

**Table 4.3 - 2026 Mid-day Peak Hour Traffic Analysis Comparison  
(Cook Road & Starbucks Driveway)**

INT #2	2026 No-Build Mid-Day Peak				2026 Build Mid-Day Peak				
Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)	Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)
EBL	A	8.0	0.01	0.0	EBL	A	8.2	0.02	2.5
EB Approach	A	0.2	-	-	EB Approach	A	0.5	-	-
NBT	B	13.5	0.15	12.5	NBT	C	18.0	0.35	37.5
NB Approach	B	13.5	-	-	NB Approach	C	18.0	-	-

**Table 4.4 - 2026 PM Peak Hour Traffic Analysis Comparison  
(Cook Road & Starbucks Driveway)**

INT #2	2026 No-Build PM Peak				2026 Build PM Peak				
Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)	Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)
EBL	A	8.5	0.01	0.0	EBL	A	8.7	0.04	2.5
EB Approach	A	0.2	-	-	EB Approach	A	0.6	-	-
NBT	C	16.9	0.13	10.0	NBT	C	24.7	0.40	45.0
NB Approach	C	16.9	-	-	NB Approach	C	24.7	-	-

It was determined that conditions at the intersection of Cook Road and Starbucks Driveway during the Mid-day and PM peak hours will operate with level-of-service C or better under the forecasted 2026 No-Build and Build conditions.

The Mid-day and PM peak hour comparison tables indicate that the movement, and approach LOS remain unchanged from the No-Build to the Build condition with the exception of the following:

- Northbound through movement and approach degrade from a LOS B to a LOS C in the Mid-day peak hour.

The 2026 AM and PM peak hour comparison tables for the intersection of Cook Road and Starbucks Driveway shown previously, indicate that the levels-of-service are within the acceptable range shown in *Table 1.2, Page 4* as stated in the **ODOT OATS Manual** <sup>(6)</sup>.

No improvements were found to be necessary to accommodate the site generated traffic volumes under the forecasted 2026 conditions at the intersection of Cook Road and Starbucks Driveway.

### **2036 Traffic Analysis - No-Build & Build Conditions**

Traffic analyses were performed for the projected 2036 conditions under the No-Build and Build scenarios so:

1. any existing roadway/intersection deficiencies can be identified in the No-Build scenario which would not be attributable to the development, and;
2. a comparison can be made to determine the changes in the traffic operations which may be attributed to the development.

The traffic volumes used in the 2036 No-Build analyses can be seen in **Figure 3.7, Appendix A**. Copies of the capacity worksheets for the 2036 No-Build analyses are included in **Appendix K**.

The traffic volumes used in the 2036 Build analyses can be seen in **Figure 3.9, Appendix A**. Copies of the capacity worksheets for the 2036 Build analyses are included in **Appendix L**.

**1. Lorain Road & Cook Road / Lear Nagle Road**

The peak hour traffic analysis results of the 2036 No-Build versus Build conditions for the signalized intersection of Lorain Road and Cook Road / Lear Nagle Road is shown in the following tables:

**Table 4.5 - 2036 Mid-day Peak Hour Traffic Analysis Comparison  
(Lorain Road & Cook Road / Lear Nagle Road)**

Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2036 Mid-Day (Signal, 110s) No-Build					Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2036 Mid-Day (Signal, 110s) Build				
	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)		LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)
EBL	B	18.5	0.479	0.31	154	EBL	C	20.3	0.504	0.33	162
EBT	C	23.2	0.301	0.16	159	EBT	C	25.8	0.340	0.18	175
EBR	C	23.4	0.307	0.15	149	EBR	C	26.1	0.347	0.17	162
EB Approach	C	21.5	-	-	-	EB Approach	C	23.9	-	-	-
WBL	C	20.5	0.187	0.25	62	WBL	C	22.8	0.254	0.33	82
WBT	C	26.6	0.294	0.14	139	WBT	C	29.2	0.322	0.15	145
WBR	B	16.5	0.304	0.27	144	WBR	B	18.6	0.322	0.28	153
WB Approach	C	22.3	-	-	-	WB Approach	C	24.6	-	-	-
NBL	D	39.1	0.650	0.86	146	NBL	D	38.2	0.677	0.92	157
NBT	D	46.7	0.854	0.25	252	NBT	D	45.3	0.872	0.29	286
NB Approach	D	43.8	-	-	-	NB Approach	D	42.7	-	-	-
SBL	D	46.0	0.849	0.44	230	SBL	D	46.0	0.849	0.44	230
SBT	D	42.0	0.877	0.33	332	SBT	D	39.6	0.840	0.34	342
SB Approach	D	44.3	-	-	-	SB Approach	D	43.1	-	-	-
<b>Intersection</b>	<b>C</b>	<b>32.6</b>	-	-	-	<b>Intersection</b>	<b>C</b>	<b>33.4</b>	-	-	-

**Table 4.6 - 2036 PM Peak Hour Traffic Analysis Comparison  
(Lorain Road & Cook Road / Lear Nagle Road)**

Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2036 PM (Signal, 120s) No-Build					Int #1 Lorain Rd. & Cook Rd./Lear Nagle Rd.	2036 PM (Signal, 120s) Build				
	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)		LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)
EBL	E	74.3	0.975	0.63	309	EBL	F	86.8	1.012	0.71	349
EBT	D	36.5	0.551	0.30	295	EBT	D	38.5	0.581	0.31	307
EBR	D	36.9	0.555	0.28	276	EBR	D	39.0	0.586	0.29	286
EB Approach	D	50.4	-	-	-	EB Approach	E	56.1	-	-	-
WBL	C	28.1	0.457	0.47	118	WBL	C	28.3	0.507	0.50	126
WBT	D	38.1	0.550	0.26	255	WBT	D	38.1	0.550	0.26	255
WBR	F	80.2	1.054	1.74	939	WBR	F	80.2	1.054	1.74	939
WB Approach	E	59.0	-	-	-	WB Approach	E	58.8	-	-	-
NBL	D	42.0	0.727	0.87	148	NBL	D	43.5	0.748	0.92	156
NBT	E	60.4	0.901	0.43	428	NBT	E	63.3	0.918	0.46	458
NB Approach	E	55.2	-	-	-	NB Approach	E	57.7	-	-	-
SBL	D	53.1	0.875	0.53	278	SBL	D	53.1	0.875	0.53	278
SBT	E	59.6	0.944	0.58	576	SBT	E	59.9	0.944	0.59	587
SB Approach	E	56.4	-	-	-	SB Approach	E	56.5	-	-	-
<b>Intersection</b>	<b>E</b>	<b>55.7</b>	-	-	-	<b>Intersection</b>	<b>E</b>	<b>57.4</b>	-	-	-

It was determined that conditions at the intersection of Lorain Road and Cook Road / Lear Nagle Road during the Mid-day and PM peak hours will operate with level-of-service F or better under the forecasted 2036 No-Build and Build conditions.

The Mid-day and PM peak hour comparison tables indicate that the movement, approach, and intersection LOS remain unchanged from the No-Build to the Build condition with the exception of the following:

- Eastbound left turn movement degrades from a LOS B to a LOS C in the Mid-day peak hour.
- Eastbound left turn movement degrades from a LOS E to a LOS F in the PM peak hour.
- Eastbound approach degrades from a LOS D to a LOS E in the PM peak hour

The 2036 Mid-day and PM peak hour comparison tables for the intersection of Lorain Road and Cook Road / Lear Nagle Road shown previously, indicate that the levels-of-service are not within the acceptable range shown in *Table 1.2, Page 4* as stated in the **ODOT OATS Manual** <sup>(6)</sup>.

Analysis will be performed in a later section of this report to determine what improvements will provide a level-of-service in the No-Build and Build peak periods that will adhere to the acceptable ranges shown in *Table 1.2* and as stated in the **ODOT OATS Manual** <sup>(6)</sup>.

A QSR greater than 1.0 indicates the storage length of the lane may not be adequate for the forecasted conditions. The QSR of the following lanes are greater than 1.0 in both the No-Build and Build condition in the PM peak hour:

- Westbound right turn lane.
- Eastbound left turn lane.

An analysis will be performed in a later section of this report to determine the queue length needed to mitigate the effect or any other improvement that could reduce the queue storage length for westbound right turn lane and eastbound left turn lane.

**2. Cook Road and Starbucks Driveway**

The peak hour traffic analysis results of the 2036 No-Build versus Build conditions for the stop controlled intersection of Cook Road and Starbucks Driveway are shown in the following tables:

**Table 4.7 - 2036 Mid-day Peak Hour Traffic Analysis Comparison  
(Cook Road & Starbucks Driveway)**

INT #2	2036 No-Build Mid-Day Peak			One-Way Stop	INT #2	2036 Build Mid-Day Peak			One-Way Stop
Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)	Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)
EBL	A	8.0	0.01	0.0	EBL	A	8.2	0.02	2.5
EB Approach	A	0.2	-	-	EB Approach	A	0.5	-	-
NBT	B	14.1	0.16	15.0	NBT	C	19.1	0.37	42.5
NB Approach	B	14.1	-	-	NB Approach	C	19.1	-	-

**Table 4.8 - 2036 PM Peak Hour Traffic Analysis Comparison  
(Cook Road & Starbucks Driveway)**

INT #2	2036 No-Build PM Peak			One-Way Stop	INT #2	2036 Build PM Peak			One-Way Stop
Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)	Cook Rd. & Starbucks Driveway	LOS	Delay (sec/veh)	v/c	95th %tile Queue (Feet)
EBL	A	8.6	0.01	0.0	EBL	A	8.8	0.04	2.5
EB Approach	A	0.2	-	-	EB Approach	A	0.6	-	-
NBT	C	17.8	0.14	12.5	NBT	D	27.1	0.43	50.0
NB Approach	C	17.8	-	-	NB Approach	D	27.1	-	-

It was determined that conditions at the intersection of Cook Road and Starbucks Driveway during the Mid-day and PM peak hours will operate with level-of-service D or better under the forecasted 2036 No-Build and Build conditions.

The Mid-day and PM peak hour comparison tables indicate that the movement, and approach LOS remain unchanged from the No-Build to the Build condition with the exception of the following:

- Northbound through movement and approach degrade from a LOS B to a LOS C in the Mid-day peak hour.
- Northbound through movement and approach degrade from a LOS C to a LOS D in the PM peak hour.

The 2036 AM and PM peak hour comparison tables for the intersection of Cook Road and Starbucks Driveway shown previously, indicate that the levels-of-service are within the acceptable range shown in *Table 1.2, Page 4* as stated in the **ODOT OATS Manual** <sup>(6)</sup>.

No improvements were found to be necessary to accommodate the site generated traffic volumes under the forecasted 2036 conditions at the intersection of Cook Road and Starbucks Driveway.

## 4.2 Improvements for Capacity & LOS at Study Area Intersections

### 2036 Traffic Analysis - Improvements

Issues were revealed in the traffic analyses for the 2036 No-Build and Build conditions during the PM peak hour at the following location where the movement levels-of-service failed to meet the operational goals shown in *Table 1.2, Page 4*:

#### 2036 No-Build Condition

##### 1. Lorain Road and Cook Road / Lear Nagle Road

-The westbound right turn movement has a LOS F in the 2036 during the PM peak hour.

The following improvements were found to raise the LOS to a satisfactory grade:

- Construct a southbound right turn lane and provide a southbound right turn overlap with the eastbound left turn phase.
- Construct a northbound right turn lane and provide a northbound right turn overlap with the westbound left turn phase.

**1. Lorain Road & Cook Road / Lear Nagle Road**

The following table shows the capacity analysis results of the 2036 No-Build traffic signal improvement at the intersection of Lorain Road and Cook Road / Lear Nagle Road during the expected design year conditions. Copies of the capacity worksheets for the intersection are included in **Appendix M**.

**Table 4.9 - 2036 Improved No-Build Mid-day & PM Peak Hour Traffic Analysis  
(Lorain Road & Cook Road / Lear Nagle Road)**

Int #1		2036 Mid-Day (Signal, 110s) No-Build					Int #1		2036 PM (Signal, 120s) No-Build				
Lorain Rd. & Cook Rd./Lear Nagle Rd.	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)	Lorain Rd. & Cook Rd./Lear Nagle Rd.	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)		
EBL	B	16.1	0.445	0.29	144	EBL	D	48.0	0.876	0.52	254		
EBT	C	20.2	0.275	0.15	148	EBT	C	29.2	0.463	0.26	264		
EBR	C	20.3	0.280	0.14	138	EBR	C	29.5	0.466	0.25	247		
EB Approach	B	18.7	-	-	-	EB Approach	D	36.1	-	-	-		
WBL	B	17.5	0.171	0.23	56	WBL	C	22.4	0.394	0.42	105		
WBT	C	23.0	0.260	0.13	130	WBT	C	29.9	0.437	0.23	226		
WBR	B	13.5	0.279	0.24	130	WBR	D	40.8	0.912	1.28	693		
WB Approach	B	19.0	-	-	-	WB Approach	C	34.8	-	-	-		
NBL	D	36.9	0.464	0.84	143	NBL	C	34.9	0.403	0.83	141		
NBT	D	48.5	0.805	0.20	200	NBT	E	64.7	0.886	0.35	354		
NBR	D	37.4	0.205	0.00	65	NBR	D	35.2	0.203	0.00	84		
NB Approach	D	42.5	-	-	-	NB Approach	D	51.9	-	-	-		
SBL	D	46.0	0.849	0.44	230	SBL	E	58.9	0.889	0.56	292		
SBT	D	38.7	0.493	0.17	173	SBT	D	36.8	0.469	0.21	211		
SBR	C	29.2	0.356	0.00	141	SBR	C	30.3	0.518	0.00	237		
SB Approach	D	40.8	-	-	-	SB Approach	D	45.9	-	-	-		
<b>Intersection</b>	<b>C</b>	<b>29.7</b>	-	-	-	<b>Intersection</b>	<b>D</b>	<b>40.3</b>	-	-	-		

It was determined that conditions at the intersection of Lorain Road and Cook Road / Lear Nagle Road during the Mid-day and PM peak hours will operate with level-of-service E or better under the forecasted 2036 No-Build improved conditions.

The 2036 AM and PM peak hour comparison tables for the intersection of Lorain Road and Cook Road / Lear Nagle Road shown previously, indicate that the levels-of-service are within the acceptable range shown in *Table 1.2, Page 4* as stated in the ODOT OATS Manual.

A QSR greater than 1.0 indicates the storage length of the lane may not be adequate for the forecasted conditions. The QSR of the following lanes are greater than 1.0 in the No-Build condition in the PM peak hour:

- Westbound right turn lane.

An analysis will be performed in a later section of this report to determine the queue length needed to mitigate the effect or any other improvement that could reduce the queue storage length for westbound right turn lane.

### **2036 Build Condition**

It was determined in the PM peak hour analysis that the following levels-of-service issues for the 2036 Build conditions are no within the acceptable range shown in *Table 1.2, Page 4* as stated in the **ODOT OATS Manual**<sup>(6)</sup>.

#### **1. Lorain Road and Cook Road / Lear Nagle Road**

- The westbound right turn movement is a LOS F in the during the PM peak hour.
- The eastbound left turn movement degrades to a LOS F in the 2036 Build condition during the PM peak hour.

An analysis was performed to determine if the improvements recommended for the No-Build condition would raise the LOS to a satisfactory grade.

**1. Lorain Road & Cook Road / Lear Nagle Road**

The following table shows the capacity analysis results for the 2036 Build condition utilizes the traffic signal improvement recommended for the 2036 No-Build conditions. Copies of the capacity worksheets for the intersection are included in **Appendix M**.

**Table 4.10 - 2036 Improved Build Mid-day / PM Peak Hour Traffic Analysis  
(Lorain Road & Cook Road / Lear Nagle Road)**

Int #1		2036 Mid-day (Signal, 110s) Build					Int #1		2036 PM (Signal, 120s) Build				
Lorain Rd. & Cook Rd./Lear Nagle Rd.	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)	Lorain Rd. & Cook Rd./Lear Nagle Rd.	LOS	Delay (sec/veh)	v/c	QSR	95th %tile Queue (ft)		
EBL	B	16.9	0.455	0.30	147	EBL	D	52.6	0.896	0.57	281		
EBT	C	21.4	0.297	0.16	159	EBT	C	30.4	0.482	0.27	273		
EBR	C	21.6	0.303	0.15	148	EBR	C	30.7	0.485	0.26	254		
EB Approach	B	19.8	-	-	-	EB Approach	D	38.5	-	-	-		
WBL	B	18.6	0.223	0.29	73	WBL	C	22.6	0.434	0.45	112		
WBT	C	24.1	0.270	0.13	132	WBT	C	29.9	0.437	0.23	226		
WBR	B	14.4	0.286	0.25	134	WBR	D	40.8	0.912	1.28	693		
WB Approach	B	19.9	-	-	-	WB Approach	C	34.7	-	-	-		
NBL	D	36.6	0.520	0.92	156	NBL	C	34.4	0.423	0.86	146		
NBT	D	47.8	0.815	0.22	216	NBT	E	66.1	0.894	0.37	370		
NBR	D	36.7	0.262	0.00	85	NBR	C	34.4	0.215	0.00	90		
NB Approach	D	41.7	-	-	-	NB Approach	D	52.1	-	-	-		
SBL	D	46.0	0.849	0.44	230	SBL	E	58.9	0.889	0.56	292		
SBT	D	38.1	0.524	0.19	190	SBT	D	36.8	0.484	0.22	218		
SBR	C	28.0	0.341	0.00	138	SBR	C	30.6	0.522	0.00	238		
SB Approach	D	40.4	-	-	-	SB Approach	D	45.9	-	-	-		
<b>Intersection</b>	<b>C</b>	<b>30.1</b>	-	-	-	<b>Intersection</b>	<b>D</b>	<b>40.9</b>	-	-	-		

It was determined that conditions at the intersection of Lorain Road and Cook Road / Lear Nagle Road during the Mid-day and PM peak hours will operate with level-of-service E or better under the forecasted 2036 Build improved conditions.

The 2036 AM and PM peak hour comparison tables for the intersection of Lorain Road and Cook Road / Lear Nagle Road shown previously, indicate that the levels-of-service are within the acceptable range shown in *Table 1.2, Page 4* as stated in the ODOT OATS Manual.

The previous QSR issue of the eastbound left turn lane in the 2036 Build conditions PM peak was mitigated through the improved condition.

A QSR greater than 1.0 indicates the storage length of the lane may not be adequate for the forecasted conditions. The QSR of the following lanes are greater than 1.0 in both the No-Build and Build condition in the PM peak hour:

-Westbound right turn lane.

An analysis will be performed in a later section of this report to determine the queue length needed to mitigate the effect or any other improvement that could reduce the queue storage length for westbound right turn lane.

### 4.3 Auxiliary Turning Lane Warrant Analysis

It is the intent of this section of the report to evaluate the need for exclusive deceleration and turning lanes at the Cook Road and Starbucks Driveway intersection. The turn lane warrants will be evaluated based on the following conditions:

Cook Road

- Two-lane roadway
- Speed Limit = 35 miles per hour

The following table shows the results of the analysis of the need for exclusive left and right turn lanes at the site access driveway along Cook Road under the forecasted Build conditions. Copies of the ODOT turn lane warrant graphs can be seen in **Appendix N**.

**Table 4.11 Turning Lane Warrants**

LOCATION	TURN LANE	CONDITIONS			
		2026 Opening Year		2036 Design Year	
		Mid-day	PM	Mid-day	PM
Cook Road and Starbucks Driveway	WB Left Turn Lane	NO	YES	NO	YES
	EB Right Turn Lane	NO	YES	NO	YES

The results of the turn lane analyses indicate exclusive westbound left and eastbound right turn lanes on Cook Road at the Starbucks Driveway **ARE** warranted under the expected 2026 opening year and 2036 design year Build conditions.

Under the current conditions, the northbound left turn lane from the Lorain Road and Cook Road / Lear Nagle intersection extends through the Starbucks Driveway effectively functioning as a dedicated left turn lane for both intersections. A turn lane length analysis will be used to determine the total turn lane length needed to accommodate the westbound left turn movements into the Starbucks Driveway.

### 4.4 Turn Lane Length Analysis

Analyses were performed to determine the necessary turn lane storage length in order to accommodate the westbound left turn and eastbound right turn lanes at the Starbucks Driveway that were determined to be warranted during the 2026 and 2036 Build conditions.

The turn lane calculations at the Starbucks Driveway will be based on the following conditions:

- Unsignalized Through Road
- 35 MPH Design Speed
- Condition A

The following table details the results of the turn lane length analyses based upon the highest anticipated turn volumes at the intersection under the expected 2036 Build conditions.

**Table 4.12 Turn Lane Length Analysis  
(Cook Road & Starbucks Driveway)**

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Figure 401-10 Queue Length (ft)	Fig. 401-9 Condition	Turn Lane Length (ft)
							A	
WB LT	33	1	60	0.55	35	50	50	50
EB RT	110	1	60	1.83	35	100	100	100

The turn lane length analysis concluded that the westbound left turn lane should be have a storage length of 50 feet. The 50 feet of storage length is already present within the existing left turn lane, therefore, no additional storage is needed.

The turn lane length analysis concluded that the eastbound right turn lane should be constructed with a storage length of 100 feet.

It was determined with the review of the QSR for the westbound right turn lane at the intersection of Lorain Road and Cook Road / Lear Nagle Road that the storage length of the turn lane may be inadequate for the future No-Build and Build conditions. Analyses were performed to determine the necessary turn lane storage length for this lane.

The improved 2036 condition includes the addition of right turn lanes on the northbound and southbound approaches . Analyses were performed to determine the necessary turn lane storage length for this lane.

The turn lane calculations will be based on year 2036 Build traffic volumes and the following conditions:

- Traffic Control =Signalized (120s cycle length)
- Design Speed =35 Miles Per Hour
- Condition A

The following tables details the results of the turn lane length analyses based upon the highest anticipated turn volumes at the intersections under the expected 2036 Build peak hour conditions.

**Table 4.13 Turn Lane Length Analysis  
(Lorain Road & Cook Road / Lear Nagle Road)**

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Figure 401-10 Queue Length (ft)	Fig. 401-9 Condition	Backup Length (ft)	Turn Lane Length (ft)
							A		
NB RT	167	1	30	5.56	35	250	250		400
NB T	311	1	30	10.36	35	400		400	
SB RT	290	1	30	9.67	35	375	375		375
SB T	239	1	30	7.96	35	325		325	
WB RT	840	1	30	28.00	35	925	925		800
WB T	550	2	30	9.16	35	375		375	

The turn lane length analysis concluded that the northbound right turn lane should be constructed with a storage length of 400 feet.

The turn lane length analysis concluded that the southbound right turn lane should be constructed with a storage length of 375 feet.

The turn lane length analysis concluded that the westbound right turn lane should be extended to a storage length of 800 feet.

## 4.5 Improvements to Accommodate Study Area Traffic

### Recommended Improvements to Serve Future Conditions without the Development

No improvements were recommended to accommodate the forecasted 2026 No-Build conditions at the study area intersections

The following intersection improvements are recommended to accommodate the 2036 No-Build traffic at the intersection of Lorain Road and Cook Road / Lear Nagle Road:

- Extend the westbound right turn lane to a length of 800 feet including a 50 foot taper.
- Construct a 400 foot northbound right turn lane and provide a northbound right turn overlap with the westbound left turn phase.
- Construct a 425 foot southbound right turn lane and provide a southbound right turn overlap with the eastbound left turn phase.

### Recommended Improvements to Mitigate the Traffic Associated with the Development

No additional improvements were recommended to accommodate the forecasted 2026 and 2036 Build conditions at the study area intersections.

### Development Access Recommendations

The following lane use and traffic control is recommended at the site access location under the Build conditions:

#### Cook Road and Starbucks Driveway

- Install stop sign control for the northbound driveway approach.
- Construct a 100 foot eastbound right turn lane.

The recommended lane use and traffic control for the study area to accommodate expected Build traffic volumes can be seen in **Figure 4.1, Appendix A**.

## Chapter 5

### Conclusions

Based on the results of the analyses, we offer the following conclusions and recommendations:

- 5.1 This Traffic Impact Study (TIS) has been prepared at the request of RTM Engineering Consultants for a proposed Panda Express. The development is located in the City of North Ridgeville, Lorain County, Ohio. The project site is located on the southwest quadrant of the Lorain Road and Lear Nagle Road / Cook Road intersection. **Figure 1.1, Appendix A** shows the proposed location of the development.
- 5.2 The development is expected to consist of a 2,700 square foot restaurant.
- 5.3 The site plan indicates the development will be accessed via the existing Starbucks Driveway on the south side of Cook Road. The driveway is a full access location that permits all ingress and egress turn movements.
- 5.4 The development is expected to be open by 2026.
- 5.5 The Panda Express restaurant is not open for breakfast, therefore the Mid-day and PM peak hours were evaluated for this report.
- 5.6 The weekday Mid-Day peak hour of traffic was determined to be 11:45 AM to 12:45 PM. The weekday PM peak hour of traffic was found to be 4:30 PM to 5:30 PM. These periods were used to forecast expected and future traffic volumes since they reflect the period of the highest volume of vehicular traffic flow for the study area roadways.

5.7 The development is expected to generate the following hourly traffic volumes during the peak periods as shown in the table below:

ITE TRIP GENERATION			WEEKDAY TRIP ENDS			
ITE CODE	DESCRIPTION	SIZE	Mid-day Peak Hour of Generator (AM values) (Enter/Exit)		PM Peak Hour of Generator (Enter/Exit)	
934	Fast Food Restaurant with Drive-through Window	2,700 SF	71	66	70	68
Pass-by Trips (Mid-day Not Available, PM 55%)			-	-	-37	-37
<b>TOTAL NON-PASS-BY TRIPS</b>			<b>71</b>	<b>66</b>	<b>33</b>	<b>31</b>
			<b>137</b>		<b>64</b>	

5.8 The development is expected to generate 137 trips in the Mid-day peak period and 138 trips in the PM peak period. The years 2026 (Opening Year) and 2036 (Design Year) will be analyzed for the proposed development as the peak hour site generated traffic volumes are less than 500 trips.

5.9 No improvements were recommended to accommodate the forecasted 2026 No-Build conditions at the study area intersections

5.10 The following intersection improvements are recommended to accommodate the 2036 No-Build traffic at the intersection of Lorain Road and Cook Road / Lear Nagle Road:

- Extend the westbound right turn lane to a length of 800 feet including a 50 foot taper.
- Construct a 400 foot northbound right turn lane and provide a northbound right turn overlap with the westbound left turn phase.
- Construct a 425 foot southbound right turn lane and provide a southbound right turn overlap with the eastbound left turn phase.

5.11 No additional improvements were recommended to accommodate the forecasted 2026 and 2036 Build conditions at the study area intersections.

5.12 The following lane use and traffic control is recommended at the site access location under the Build conditions:

Cook Road and Starbucks Driveway

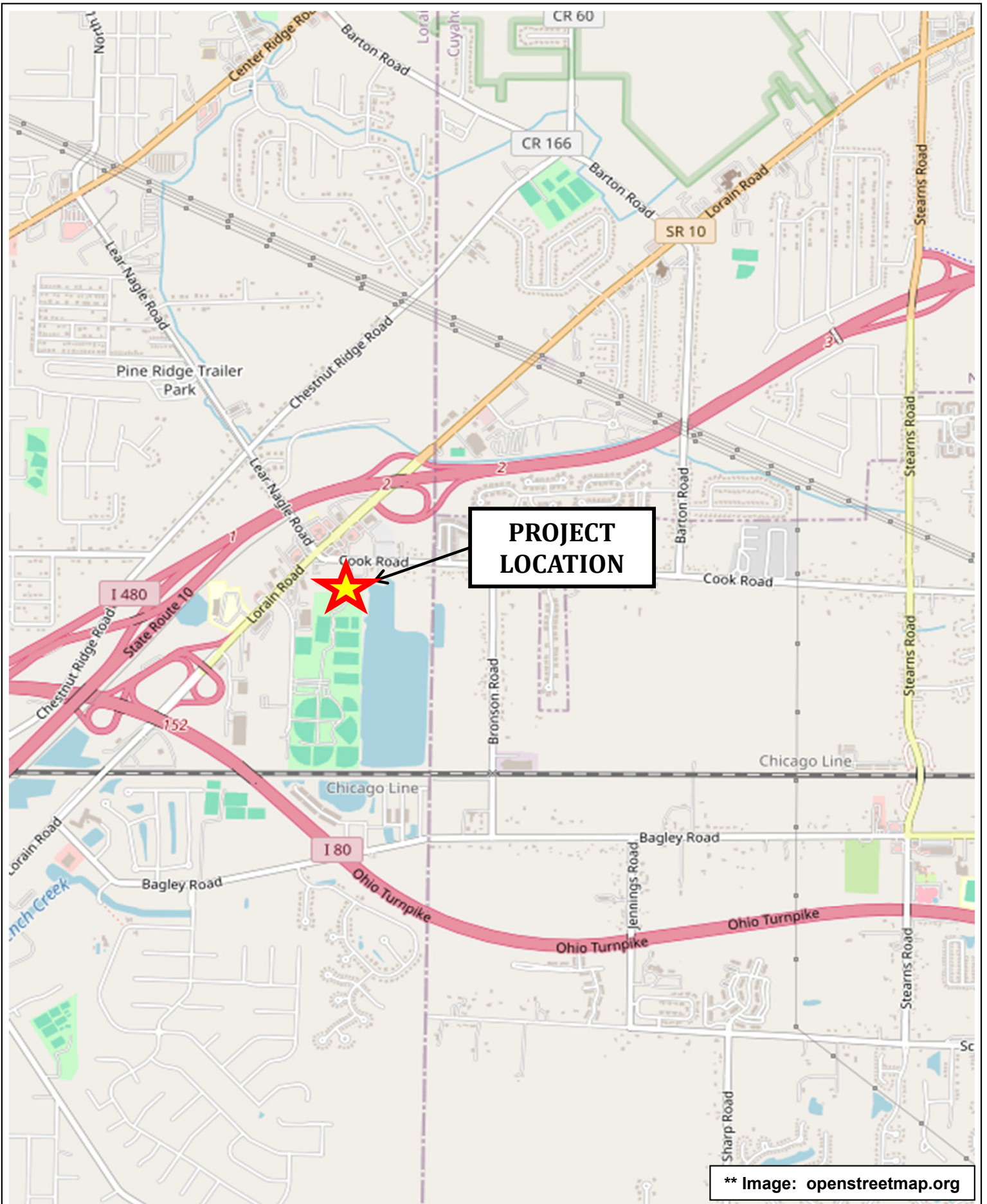
- Install stop sign control for the northbound driveway approach.
- Construct a 100 foot eastbound right turn lane.

5.13 The recommended lane use and traffic control for the study area to accommodate expected Build traffic volumes can be seen in **Figure 4.1, Appendix A**.

5.14 Based upon the results of the analysis in this study and the corresponding recommendations, it can be seen that the development traffic can be accommodated without adversely impacting the area roadway network.

# **Appendix A**

## **Figures**



\*\* Image: [openstreetmap.org](https://openstreetmap.org)

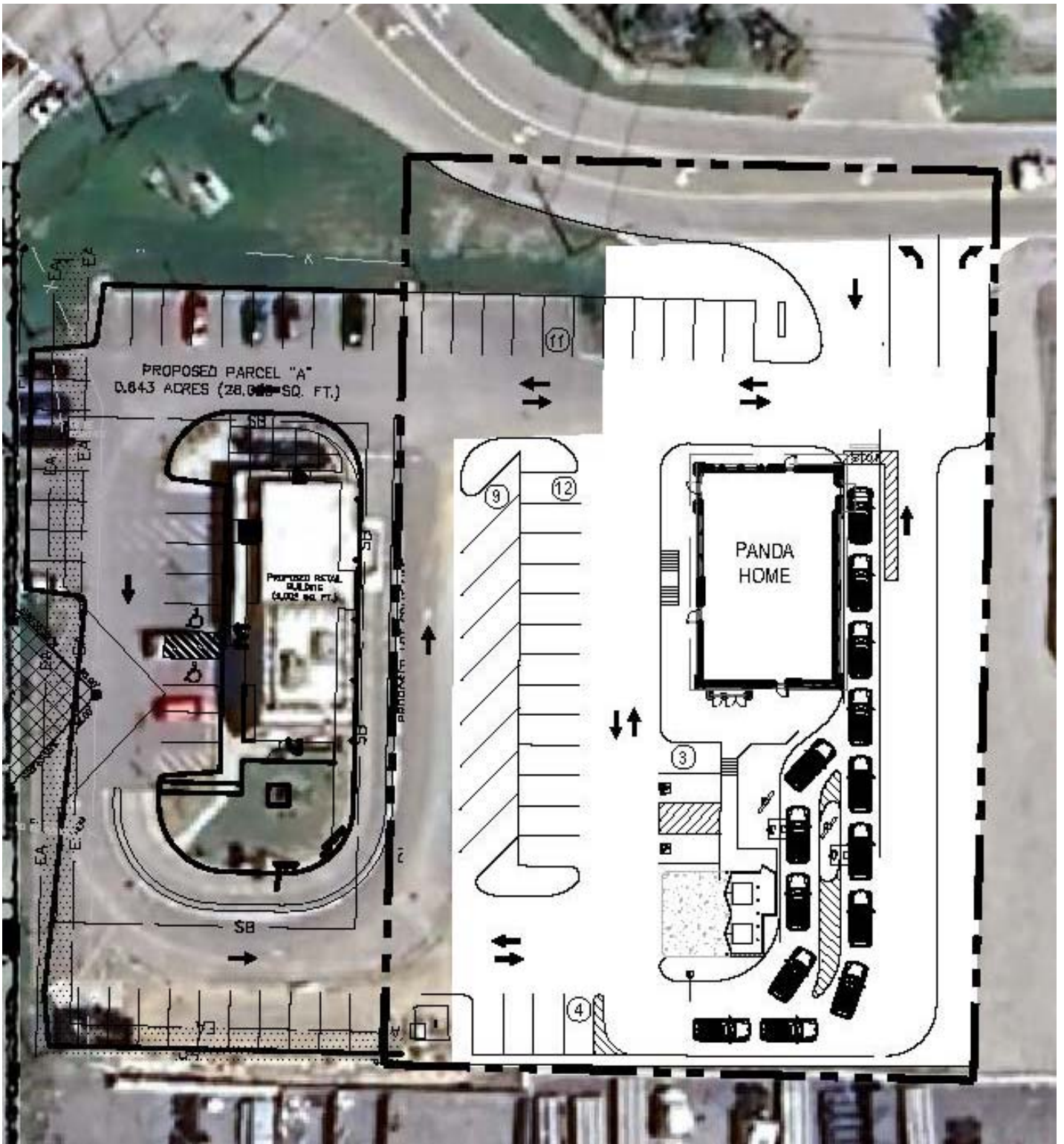
**TMS Engineers, Inc.**  
 2112 Case Parkway S., Unit 7,  
 Twinsburg, Ohio 44087  
[www.TMSEngineers.com](http://www.TMSEngineers.com)

**Panda Express  
 North Ridgeville, OH  
 Traffic Volume Forecast**

**Location Map**

↑  
**NORTH**  
 NOT TO  
 SCALE

**Figure: 1.1**  
**Appendix A**



**TMS Engineers, Inc.**

2112 Case Parkway S., Unit 7,  
Twinsburg, Ohio 44087  
www.TMSEngineers.com

**Panda Express  
North Ridgeville, OH  
Traffic Volume Forecast**

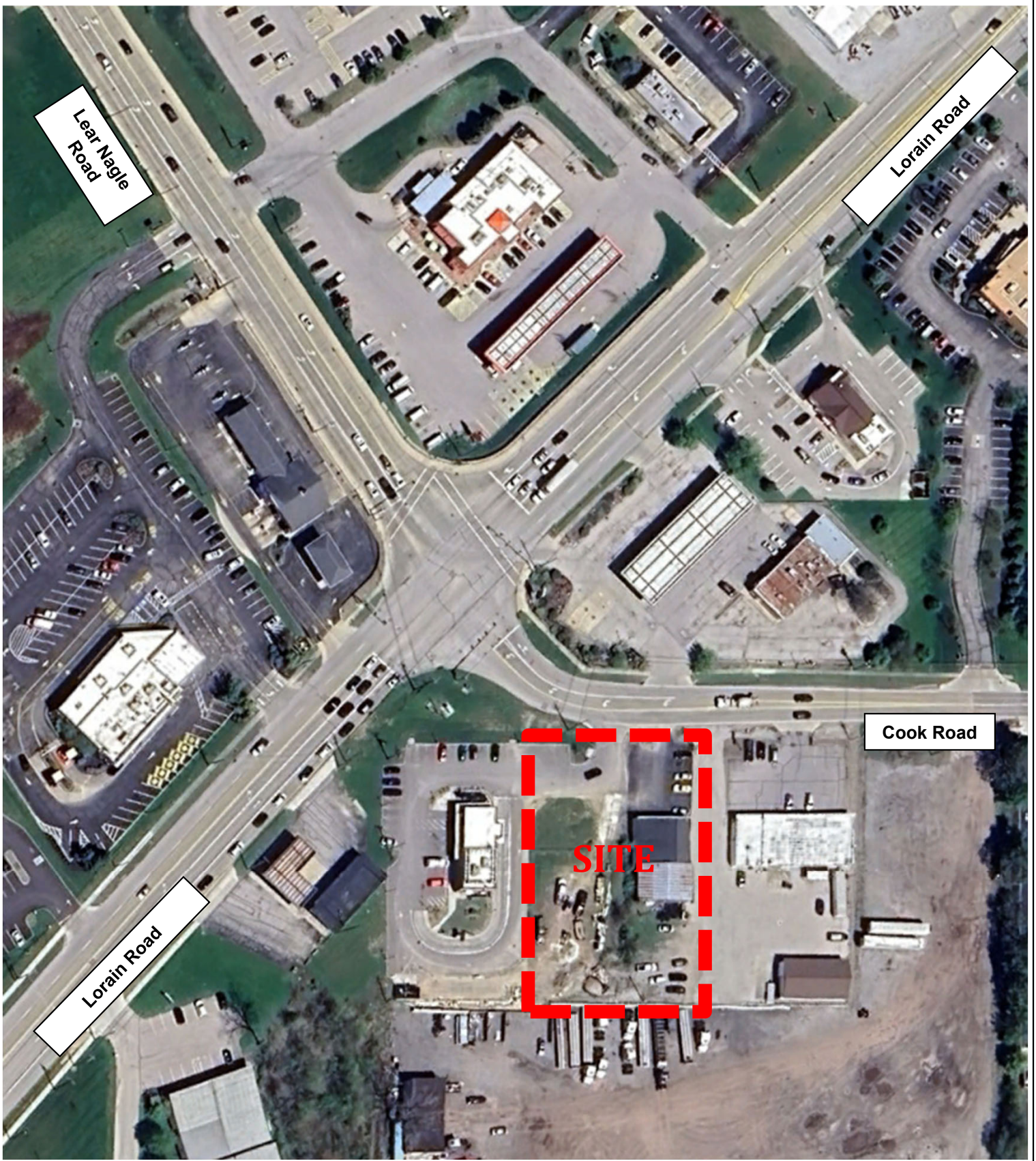
**Site Plan**

↑  
**NORTH**  
NOT TO  
SCALE

**Figure: 1.2**

**Appendix A**

\*\* Image: Google Earth



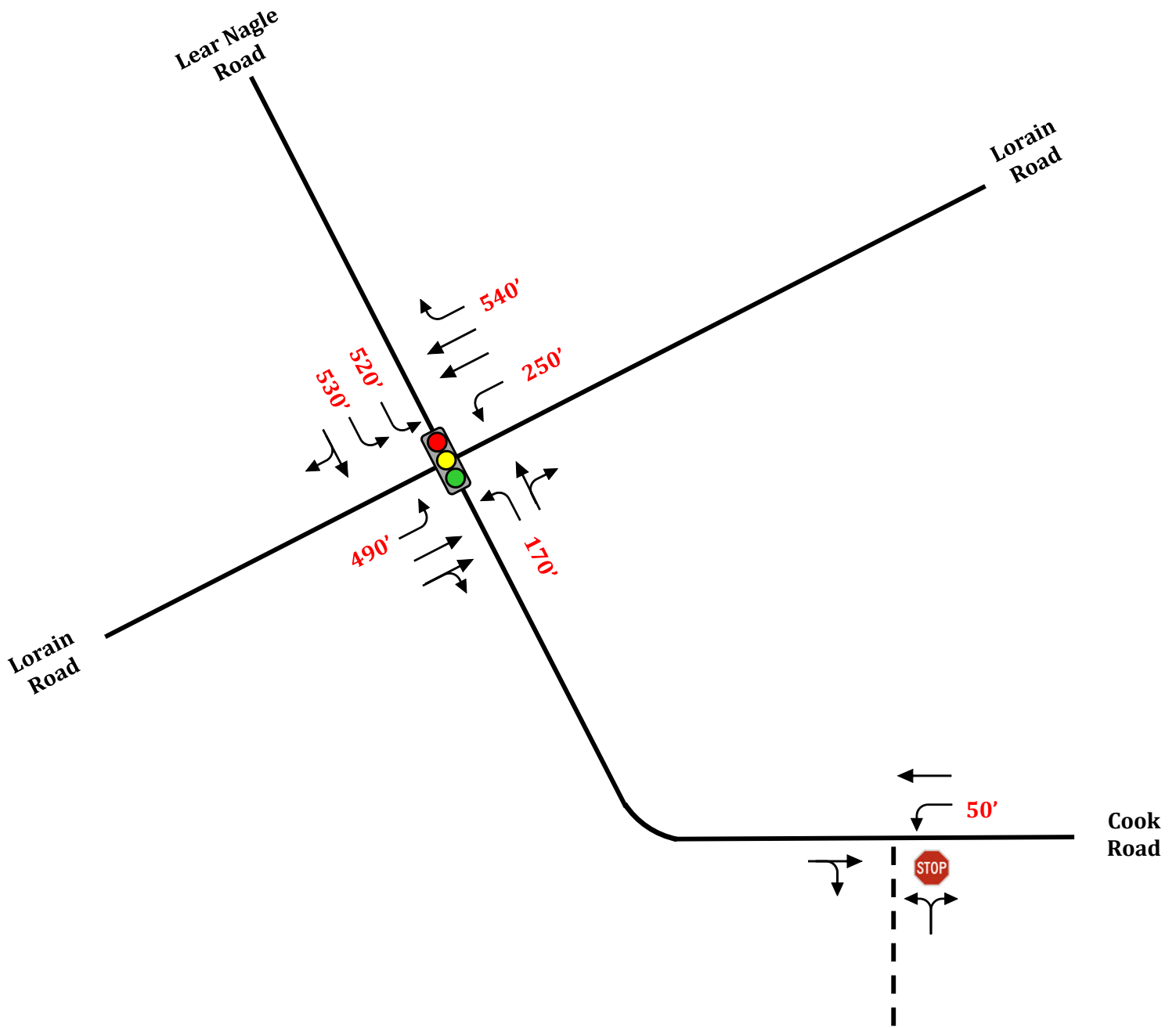
**TMS Engineers, Inc.**  
2112 Case Parkway S., Unit 7,  
Twinsburg, Ohio 44087  
www.TMSengineers.com

**Panda Express  
North Ridgeville, OH  
Traffic Volume Forecast**

**Aerial View**






↑  
**NORTH**  
NOT TO  
SCALE

**Figure: 2.1**  
**Appendix A**

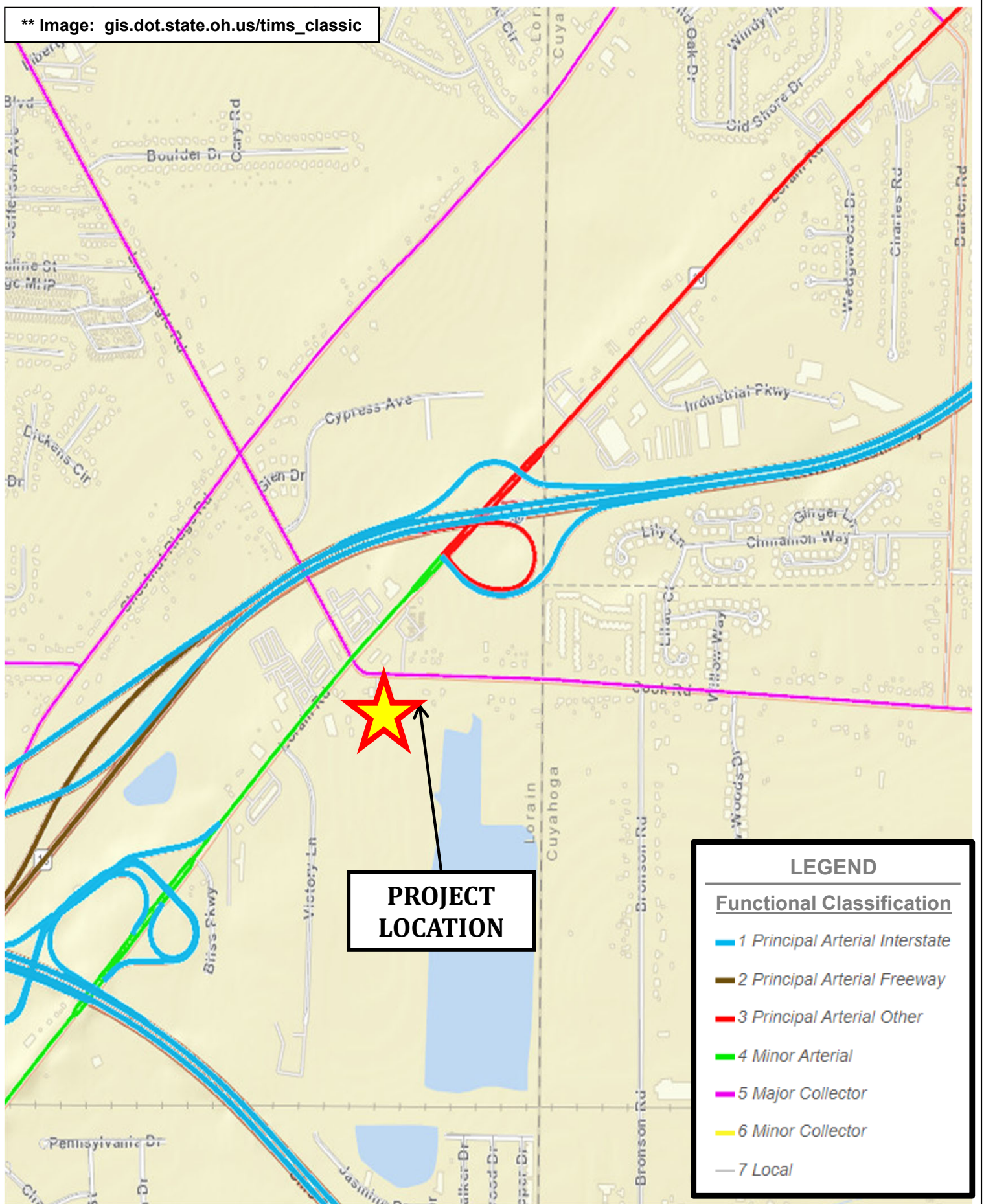


**LEGEND**

---

	Existing Lane Use		Existing Traffic Signal
	Existing Roadway		Existing Stop Sign
	Existing Driveway		
<b>XXX'</b>	Turn Lane Storage Length		

\*\* Image: gis.dot.state.oh.us/tims\_classic



**TMS Engineers, Inc.**

2112 Case Parkway S., Unit 7,  
Twinsburg, Ohio 44087  
www.TMSEngineers.com

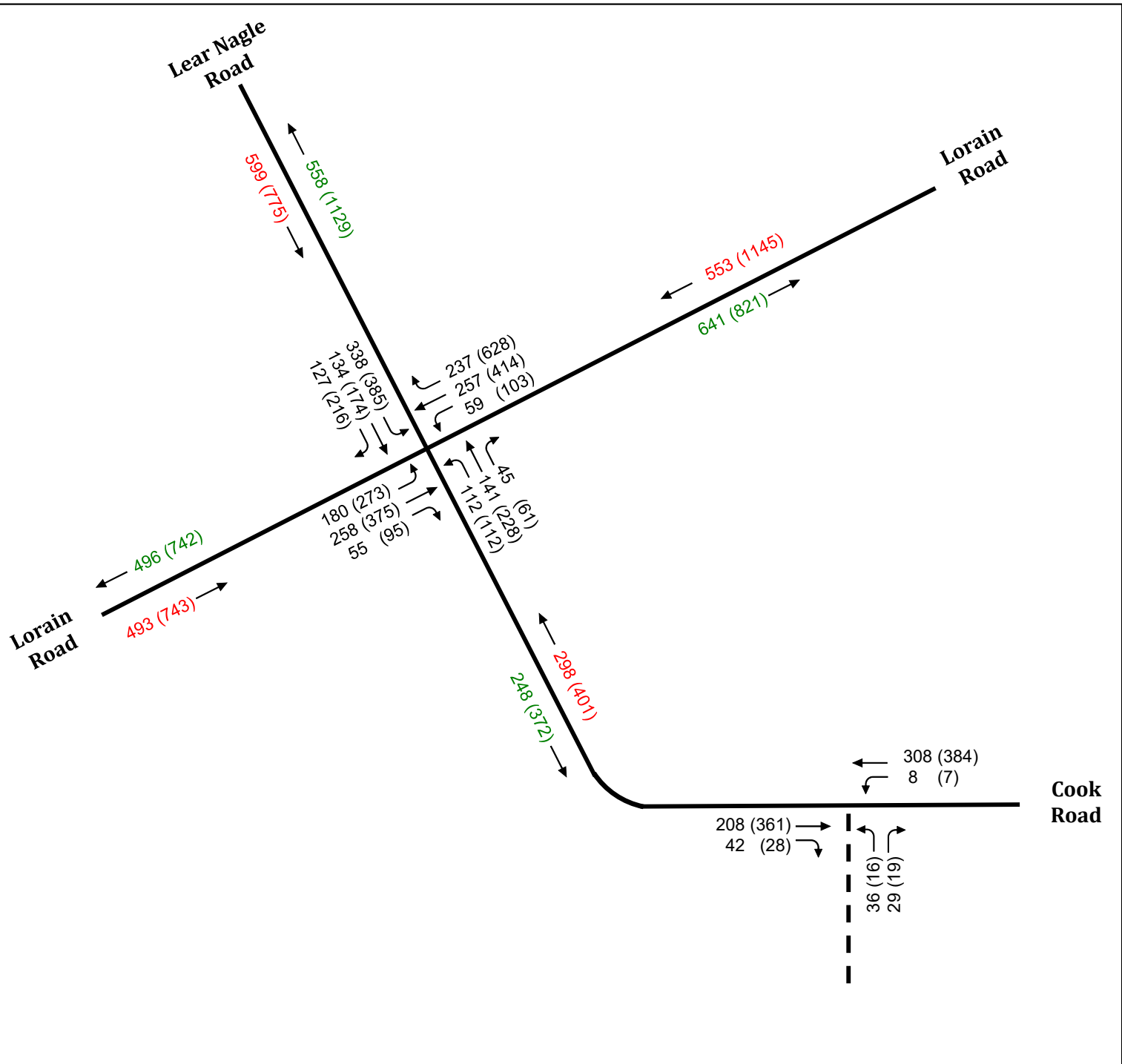
**Panda Express  
North Ridgeville, OH  
Traffic Volume Forecast**

**Functional Classification  
(ODOT TIMS)**

**NORTH**  
NOT TO  
SCALE

Figure: 2.3

Appendix A



**LEGEND**

---

XX Mid-Day Peak Hour Traffic

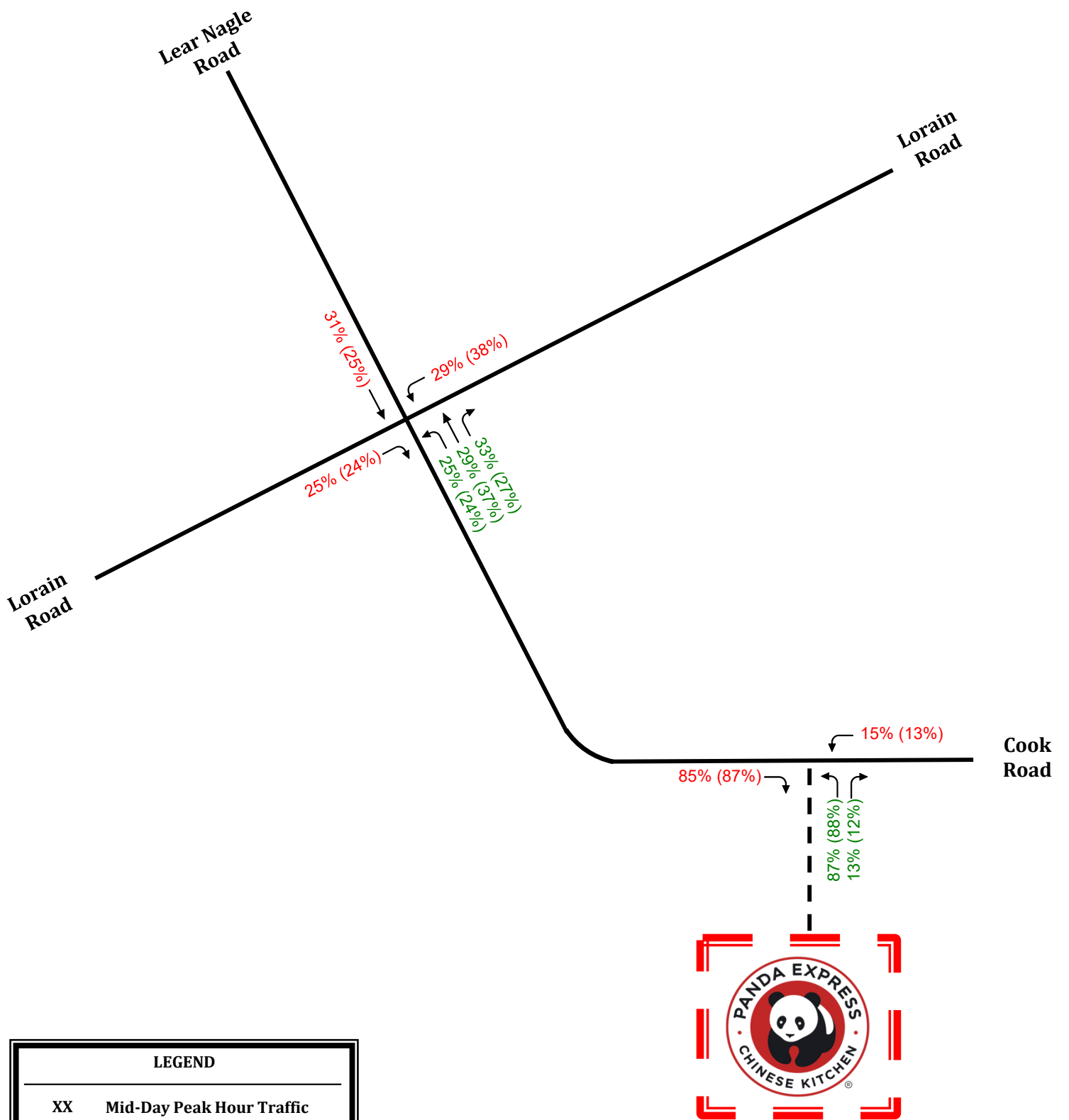
(XX) PM Peak Hour Traffic

— Existing Roadway

- - Existing Driveway

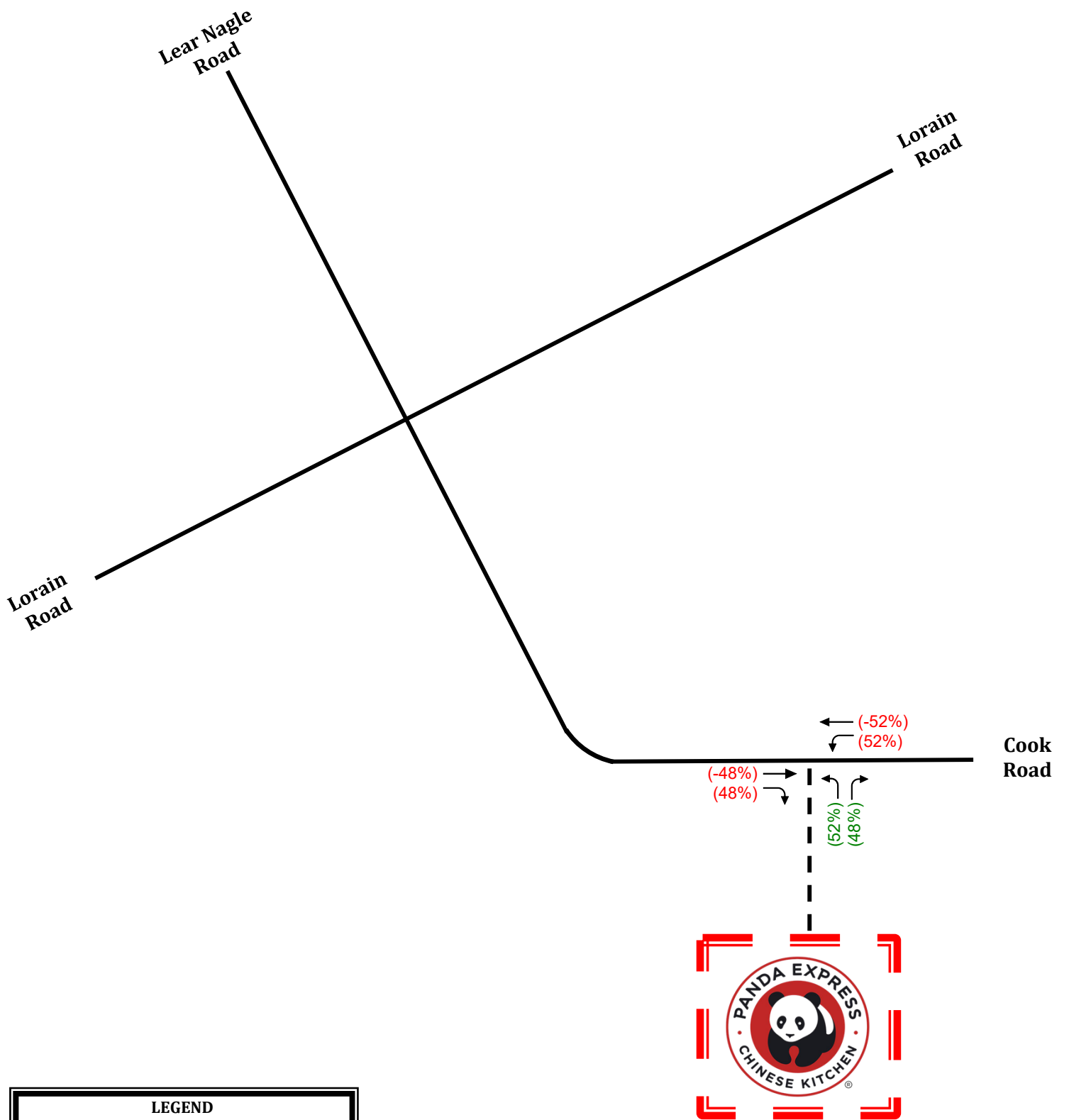
**RED = Entering Volumes  
For Trip Distributions**

**GREEN = Exiting Volumes  
For Trip Distributions**



LEGEND	
XX	Mid-Day Peak Hour Traffic
(XX)	PM Peak Hour Traffic
—	Existing Roadway
- -	Existing Driveway
RED	Entering Volumes For Trip Distributions
GREEN	Exiting Volumes For Trip Distributions





**LEGEND**

(XX) PM Peak Hour Traffic

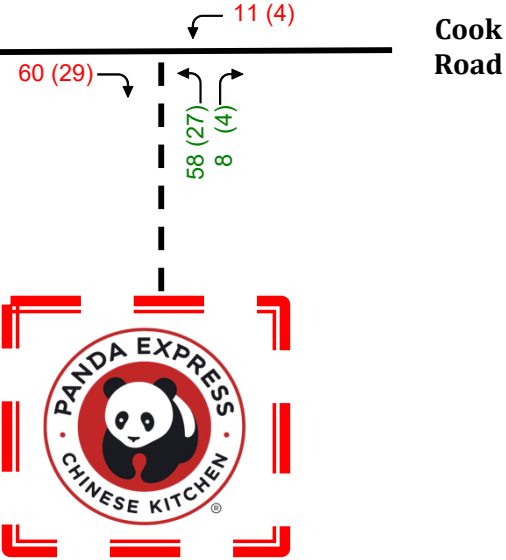
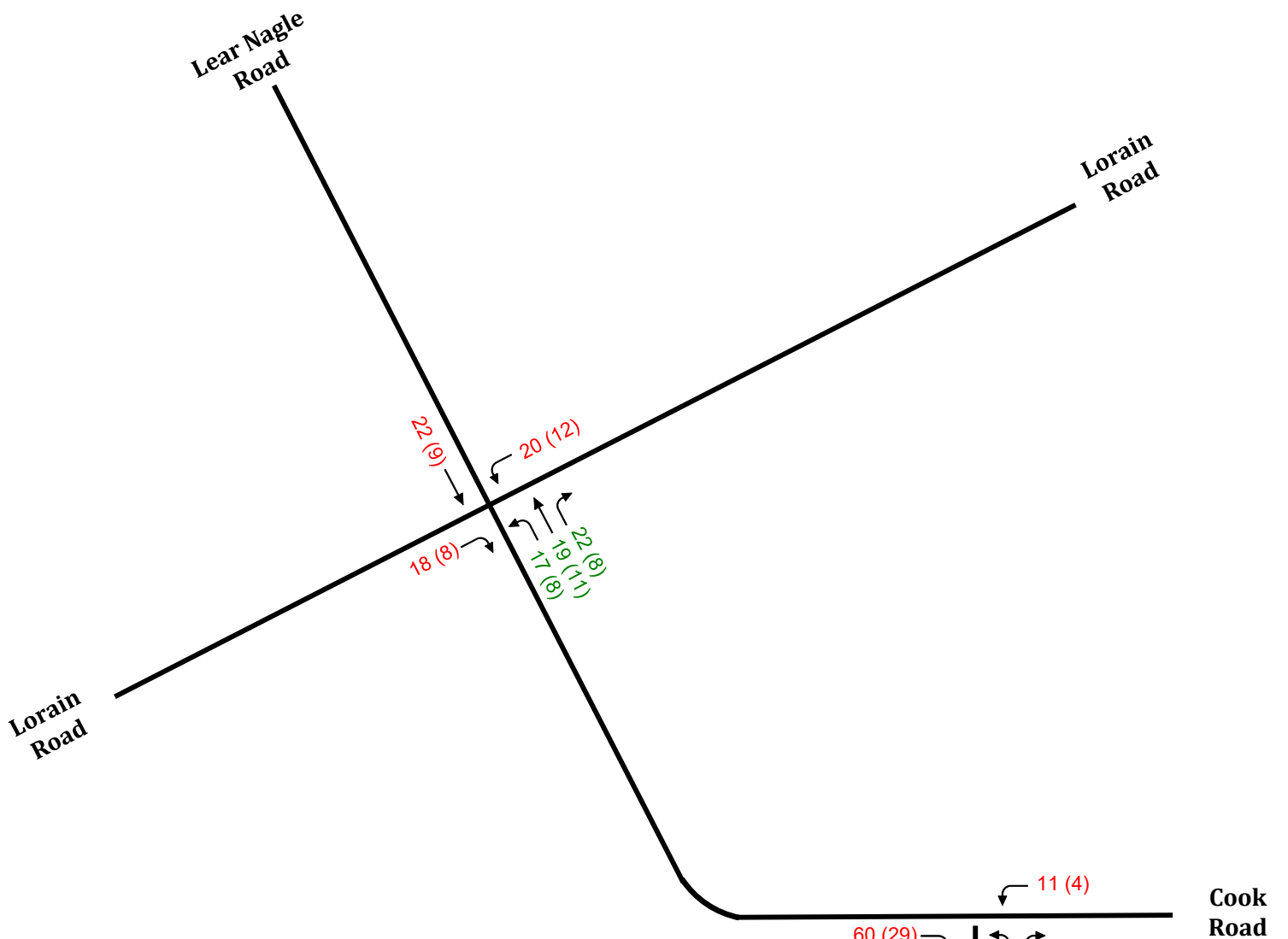
— Existing Roadway

- - Existing Driveway

**RED = Entering Volumes  
For Trip Distributions**

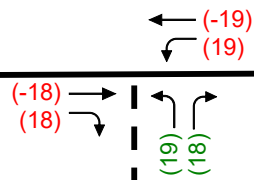
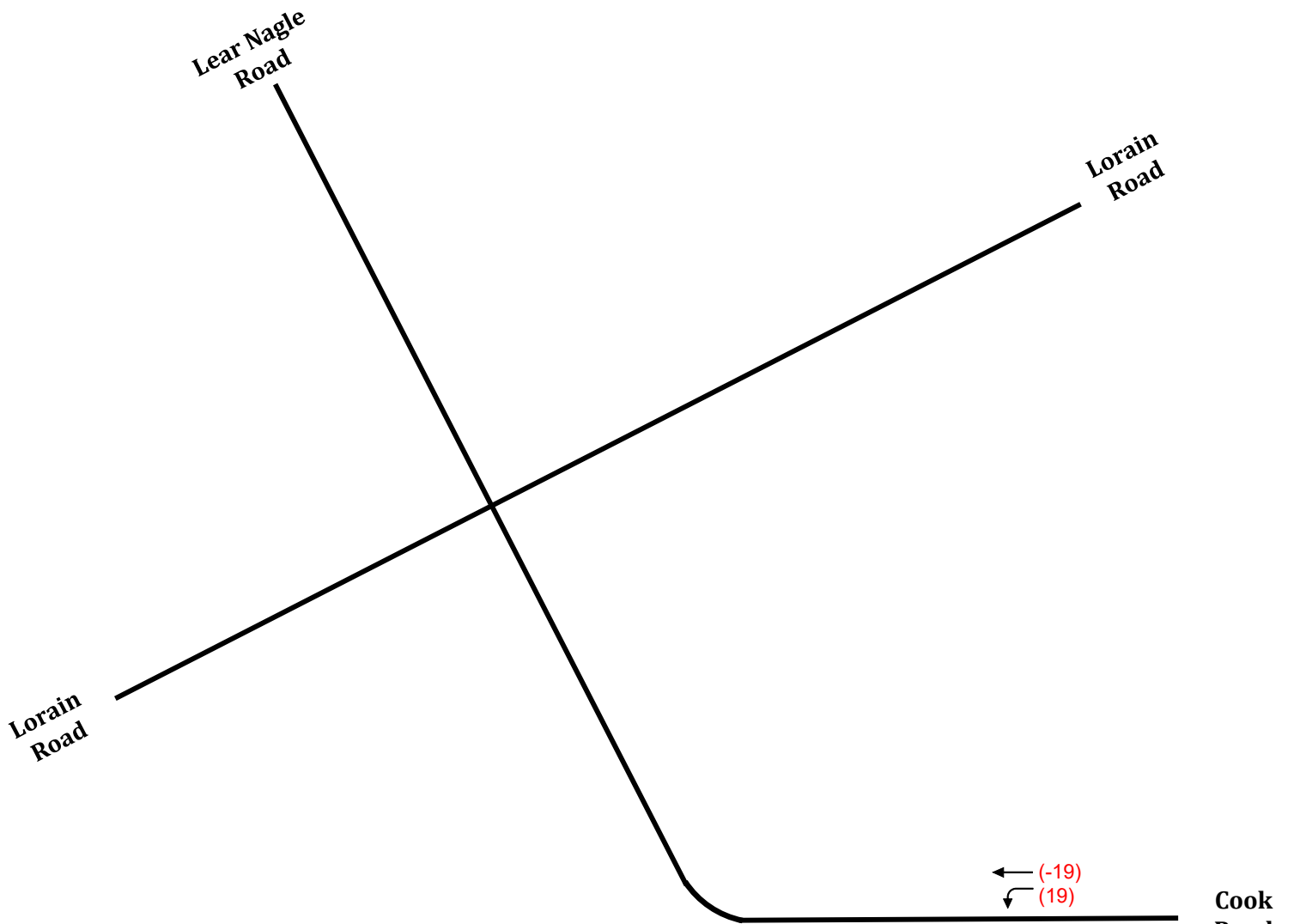
**GREEN = Exiting Volumes  
For Trip Distributions**





NON-PASS-BY TRIPS		
	Mid-Day	PM
TOTAL	137	64
ENTER	71	33
EXIT	66	31

LEGEND	
XX	Mid-Day Peak Hour Traffic
(XX)	PM Peak Hour Traffic
—	Existing Roadway
- -	Existing Driveway
RED	Entering Volumes For Trip Distributions
GREEN	Exiting Volumes For Trip Distributions

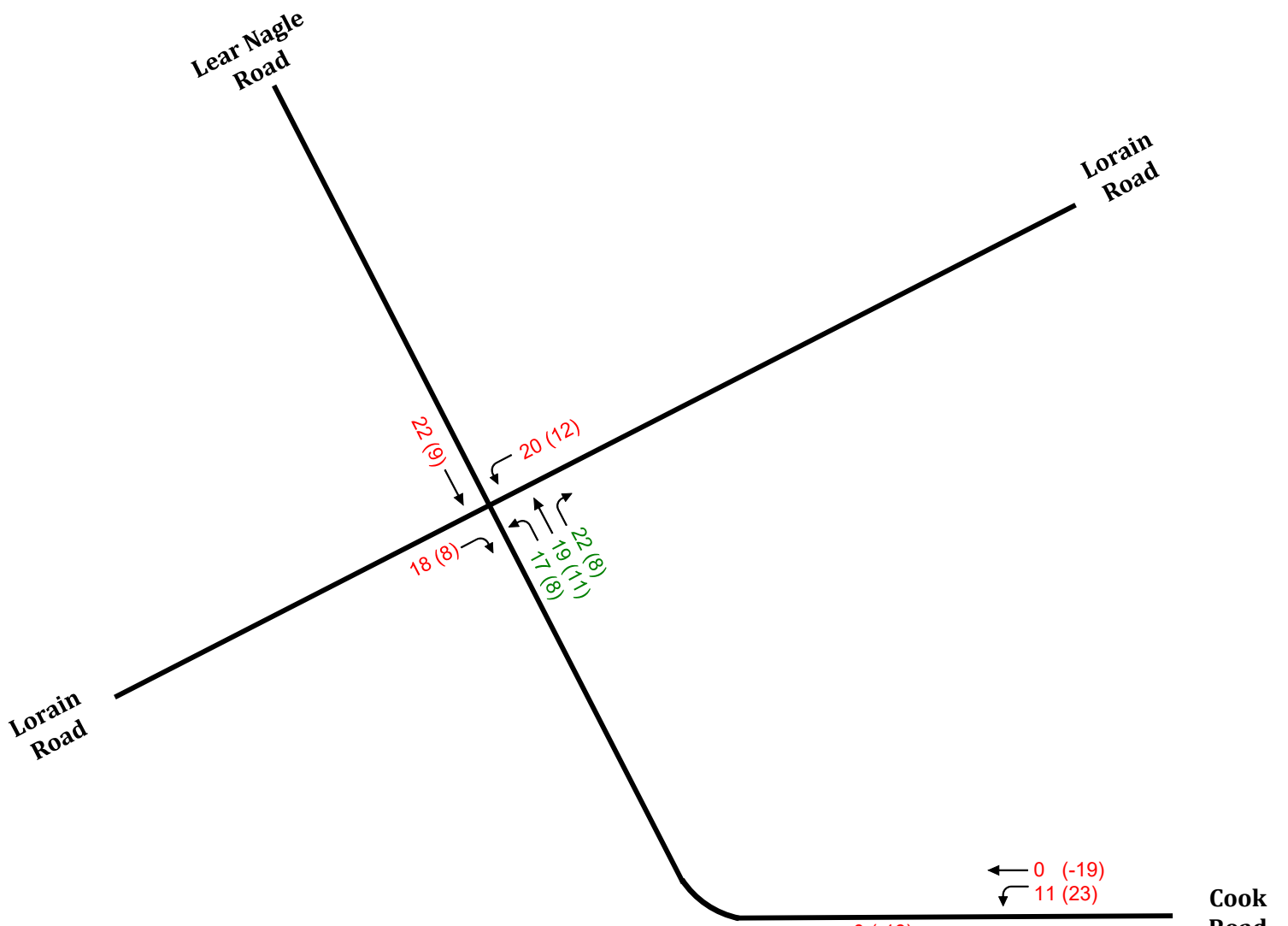


Cook Road

PASS-BY TRIPS	
	PM
TOTAL	74
ENTER	37
EXIT	37

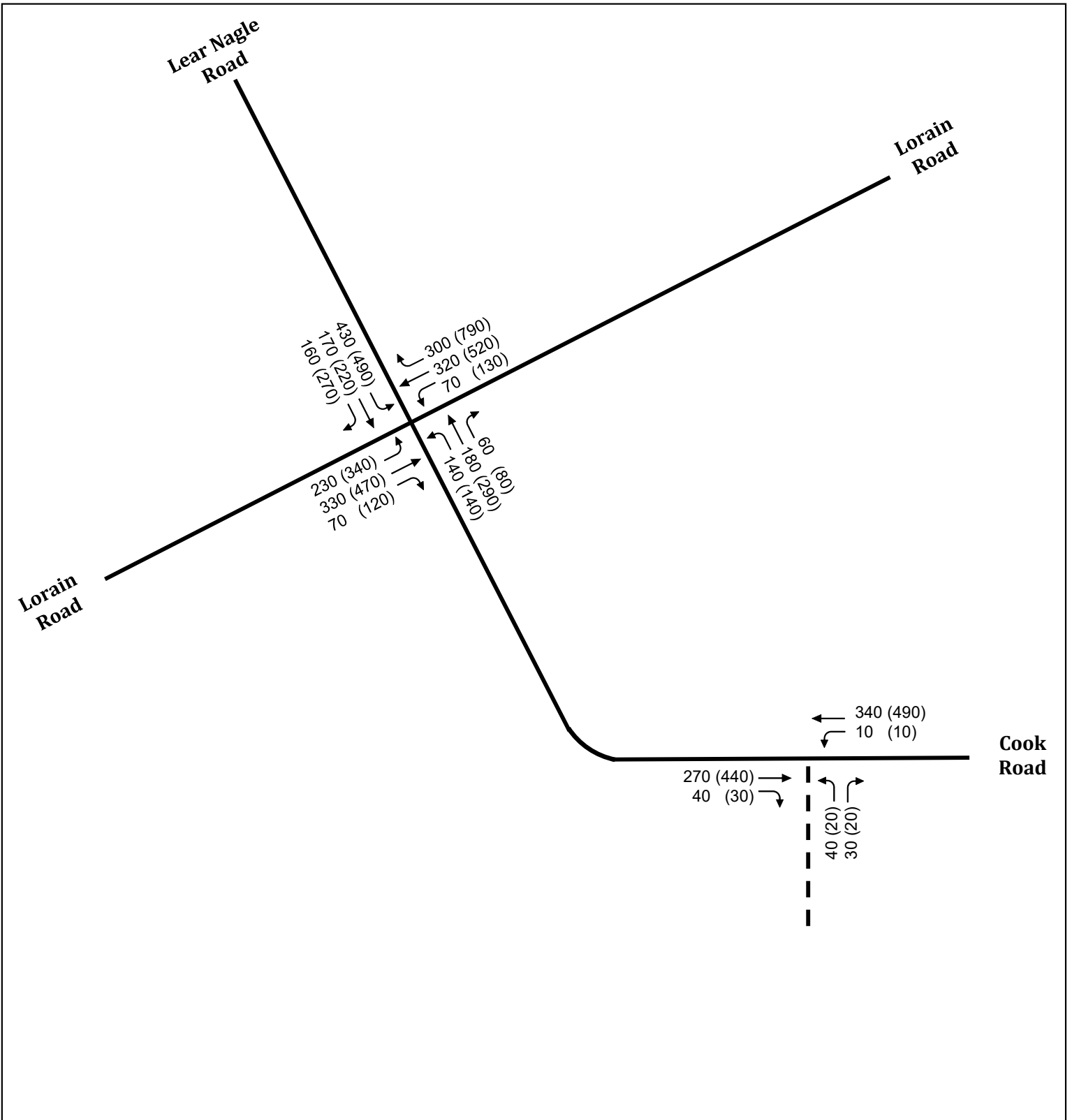
LEGEND	
(XX)	PM Peak Hour Traffic
—	Existing Roadway
- -	Existing Driveway
RED	= Entering Volumes For Trip Distributions
GREEN	= Exiting Volumes For Trip Distributions

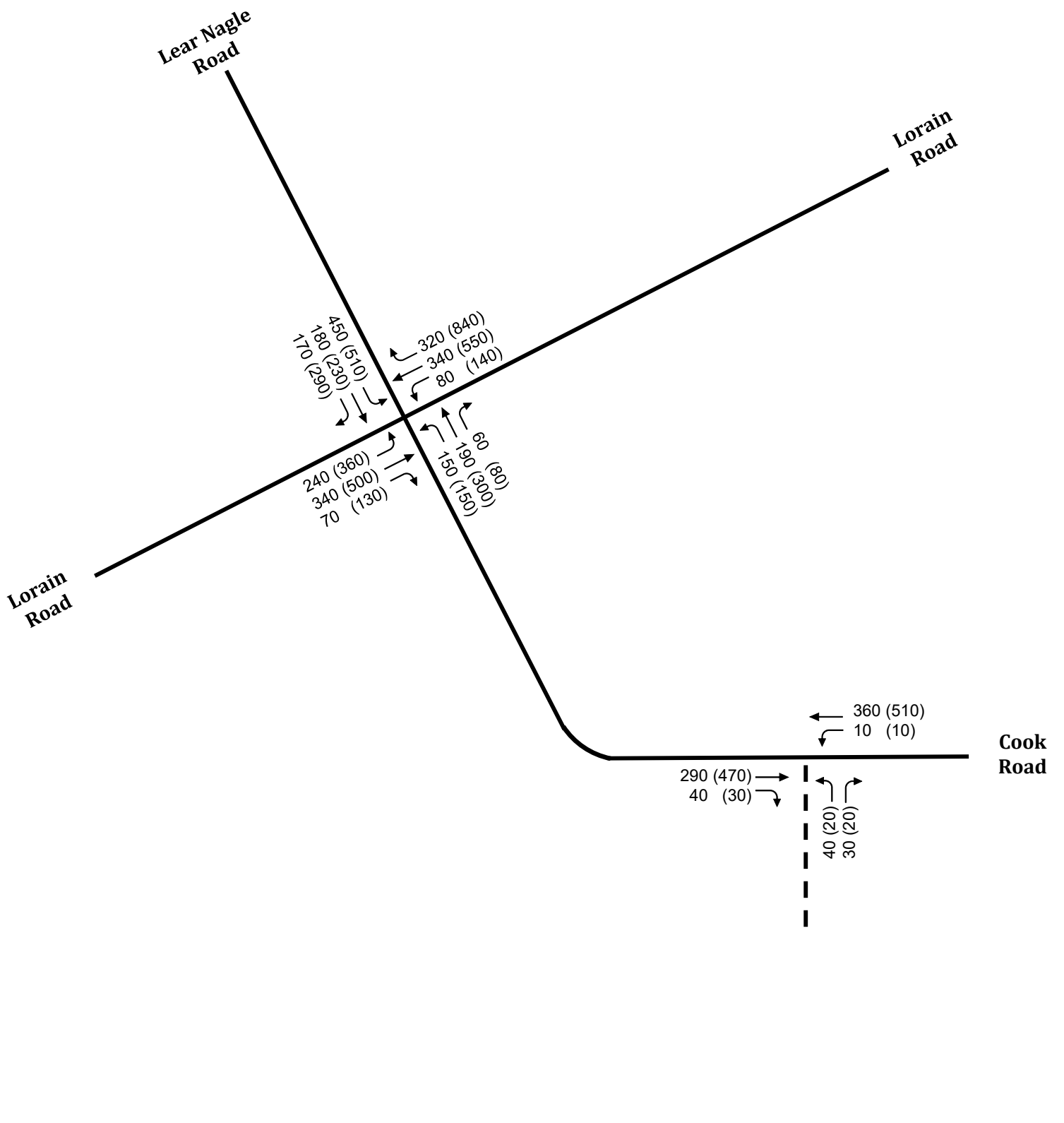




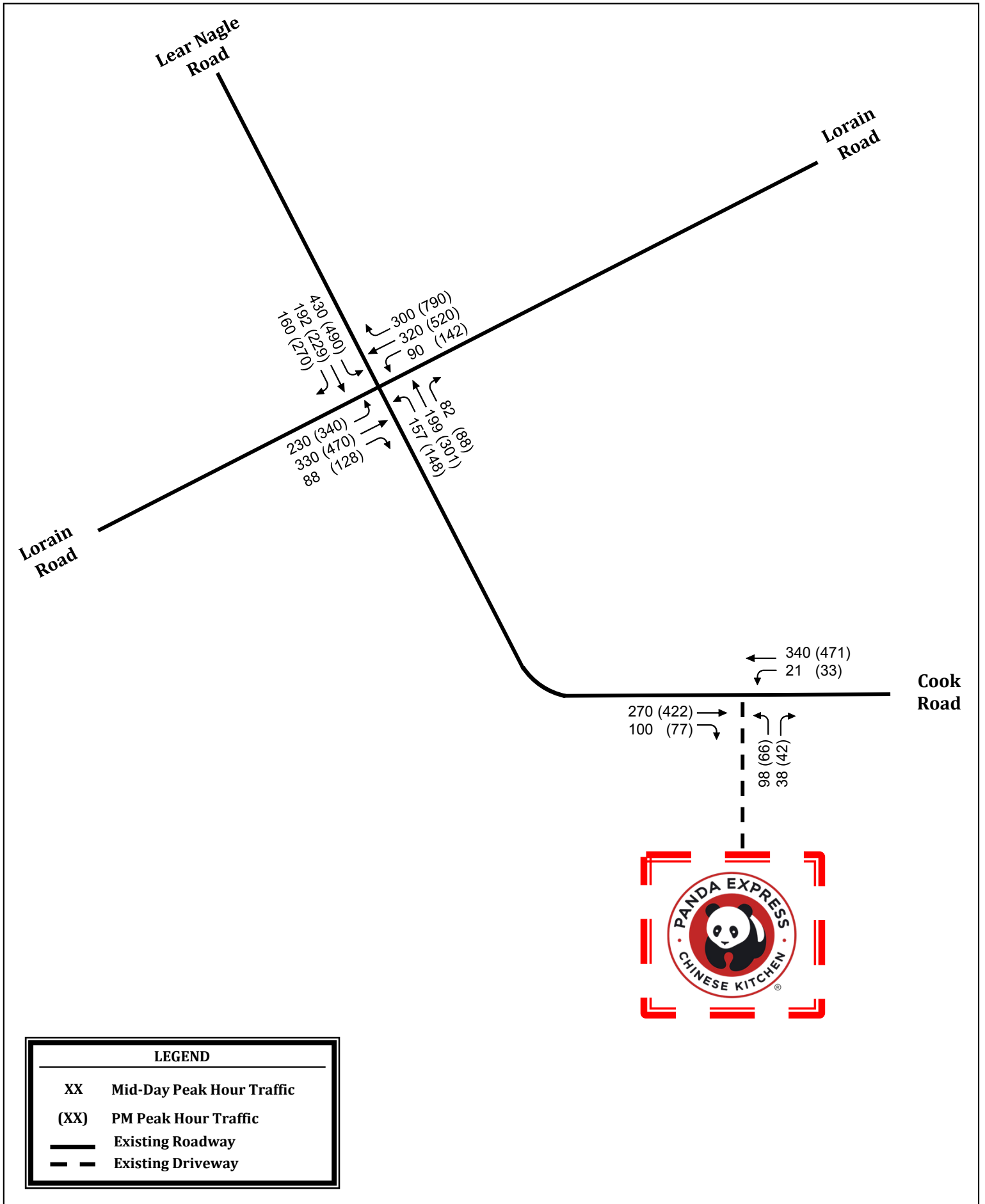
TOTAL TRIPS		
	Mid-Day	PM
TOTAL	137	138
ENTER	71	70
EXIT	66	68

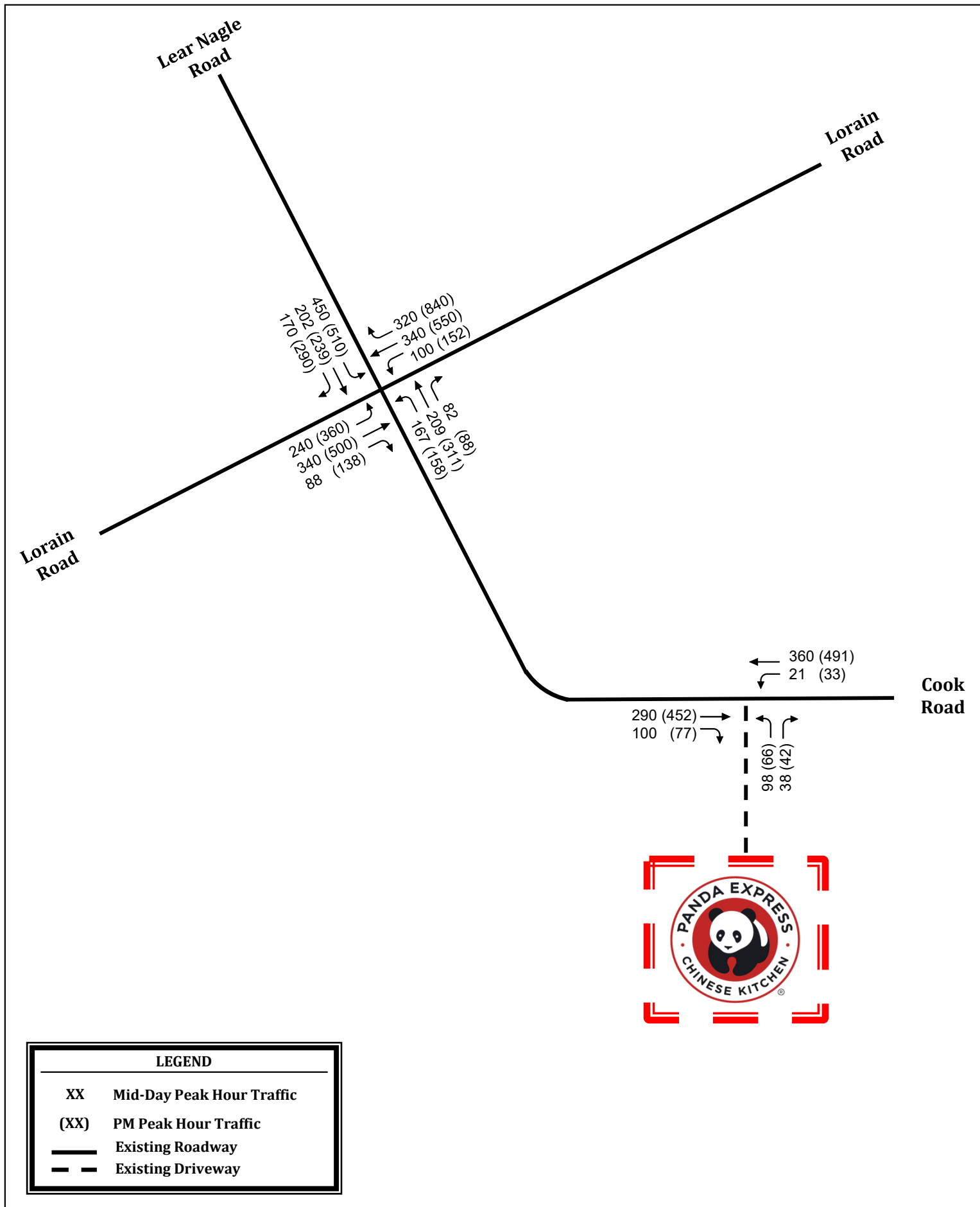
LEGEND	
XX	Mid-Day Peak Hour Traffic
(XX)	PM Peak Hour Traffic
—	Existing Roadway
- -	Existing Driveway

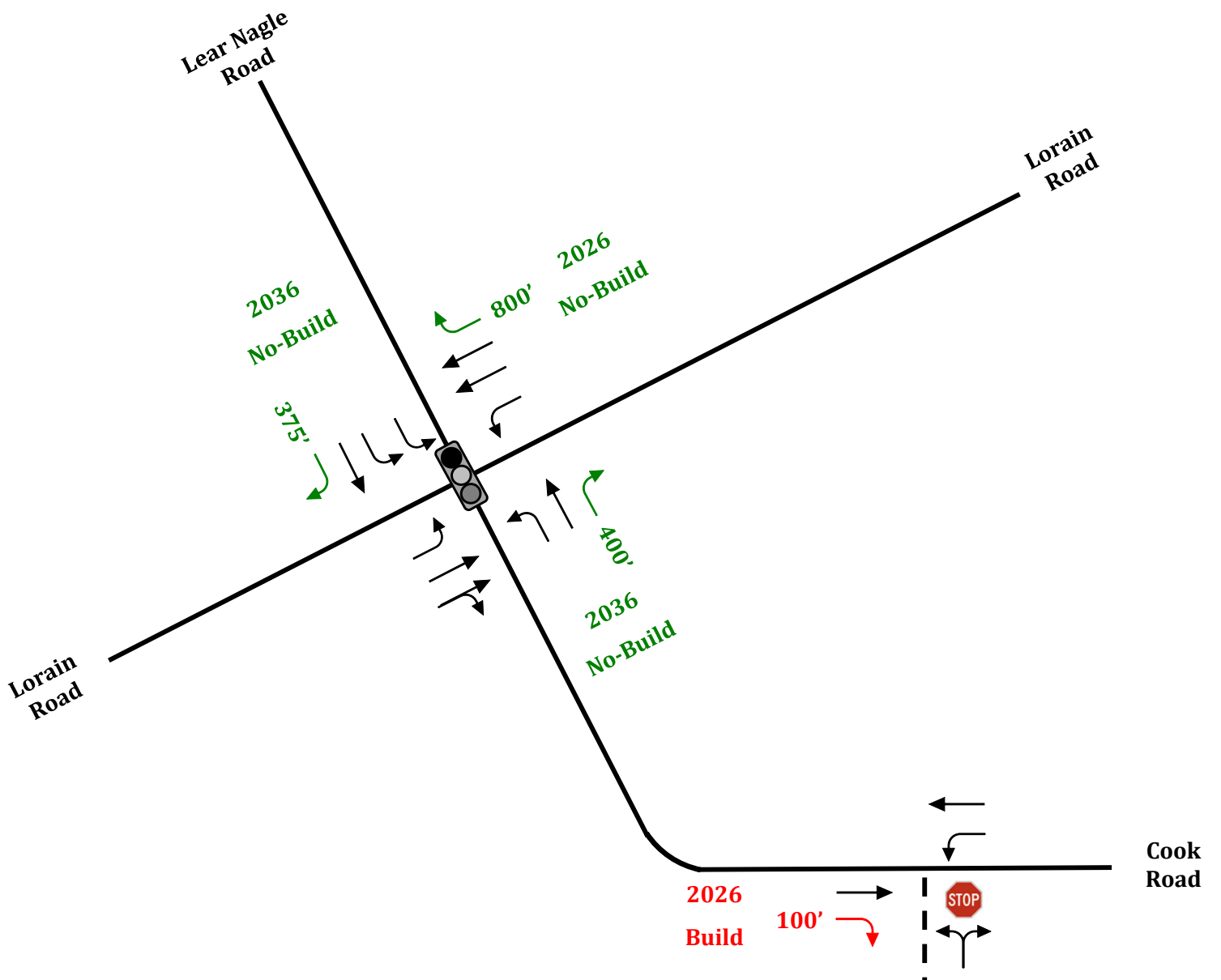




LEGEND	
XX	Mid-Day Peak Hour Traffic
(XX)	PM Peak Hour Traffic
—	Existing Roadway
- -	Existing Driveway







**LEGEND**

- Existing Lane Use
- Proposed Build Lane Use
- Proposed No-Build Lane Use
- Existing Roadway
- Existing Driveway
- Proposed Stop Sign
- Existing Traffic Signal
- Turn Lane Length



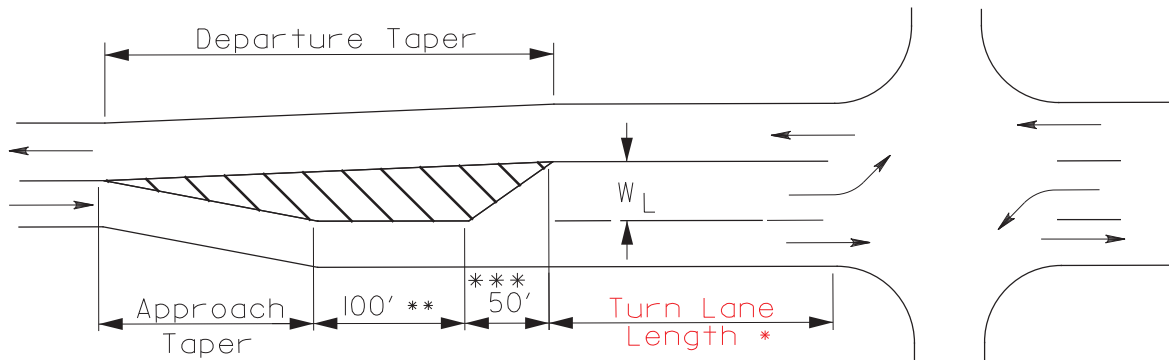
## **Appendix B**

### **ODOT Turn Lane Design Criteria**

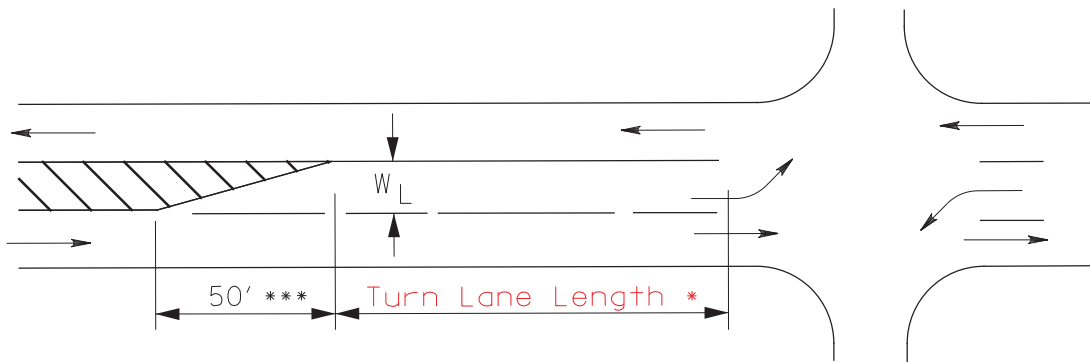
# TURNING LANE DESIGN

401-7

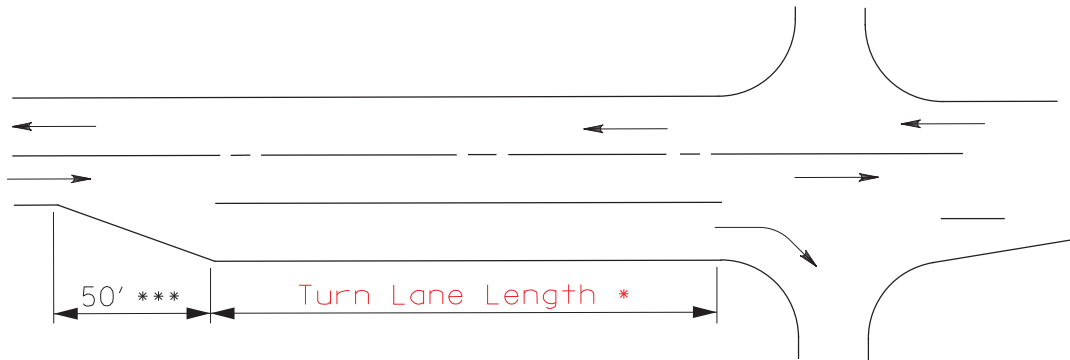
REFERENCE SECTIONS  
401.6.1, 401.6.3



LEFT TURN LANE - NO MEDIAN OR MEDIAN WIDTH <  $W_L$



LEFT TURN LANE - MEDIAN WIDTH  $\geq W_L$



RIGHT TURN LANE

- \* Turn Lane Length = Queue + Deceleration  
See Figures 401-9 and 401-10 to compute turn lane length.
  - \*\* May be reduced or eliminated in urban areas if intersection spacing or storage is constraining
  - \*\*\* Diverging taper
- $W_L$  = Turn Lane Width

# BASIS FOR COMPUTING LENGTH OF TURN LANES

**401-9**

REFERENCE SECTIONS  
401.6.1 & 401.6.3

Type of Traffic Control	Design Speed		
	30-35	40-65	
	Turn Demand Volume		
	All	Low*	High
Signalized	A	B ** C	B ** C
Unsignalized Stopped Crossroad	A	A	A
Unsignalized Through Road	A	B	B ** C

\* Low is considered 10% or less of approach traffic volume

\*\* Whichever is greater

CONDITION A	QUEUE ONLY
Length = Queue Length (Figure 401-10)	

CONDITION B	HIGH SPEED DECELERATION ONLY
Design Speed	Length (feet)
40	75
45	125
50	175
55	250
60	300
65	375

CONDITION C	MODERATE SPEED DECELERATION AND QUEUE
Design Speed	Length (feet)
40	75 + Queue Length (Figure 401-10)
45	75                   "
50	100                   "
55	125                   "
60	150                   "
65	175                   "

For explanation, see Turn Lane Design Example

# QUEUE LENGTH AT INTERSECTIONS

401-10

REFERENCE SECTIONS  
401.6.1 & 401.6.3

*Average # of Vehicles/Cycle	Queue Length (feet)
1	50
2	100
3	150
4	175
5	200
6	250
7	275
8	325
9	350
10	375
11	400
12	450
13	475
14	500
15	525
16	550
17	600
18	625
19	650
20	675
21	725
22	750
23	775
24	800
25	825
26	875
27	900
28	925
29	950
30	975

*Average # of Vehicles/Cycle	Queue Length (feet)
31	1025
32	1050
33	1075
34	1100
35	1125
36	1150
37	1175
38	1200
39	1225
40	1250
41	1300
42	1325
43	1350
44	1375
45	1400
46	1450
47	1475
48	1500
49	1525
50	1550
51	1600
52	1625
53	1650
54	1675
55	1700
56	1750
57	1775
58	1800
59	1825
60	1850

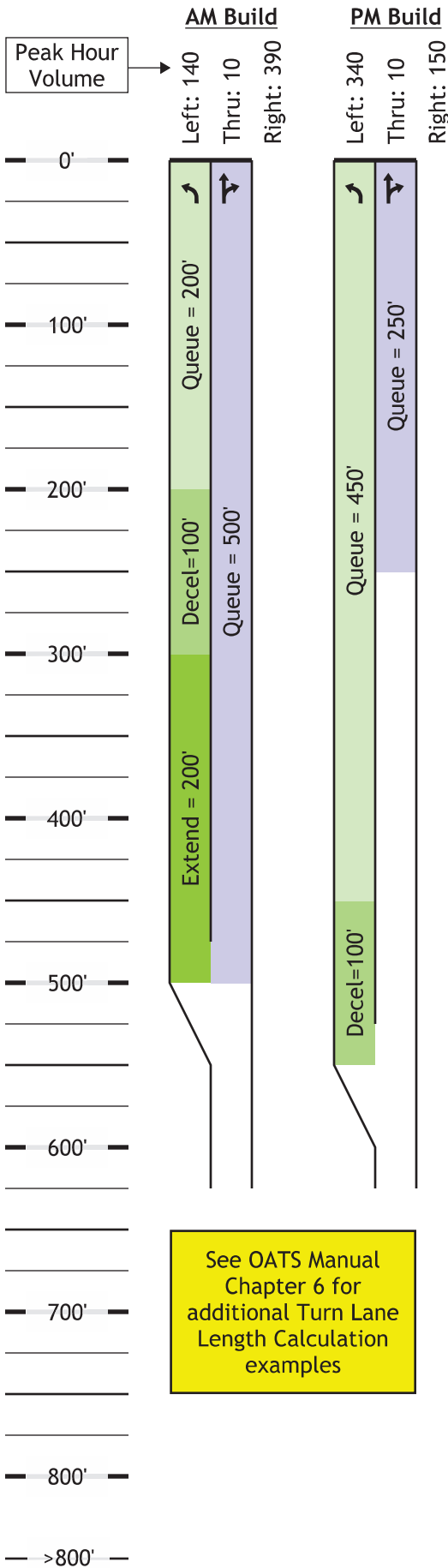
NOTE: ADDITIONAL TURN LANE STORAGE MAY BE REQUIRED WHEN THE AVERAGE VEHICLES PER CYCLE  $\geq 10$  AND THE HEAVY VEHICLES ARE  $\geq 10\%$ .


$$* \text{ AVERAGE VEHICLES PER CYCLE} = \frac{\text{DHV (TURNING LANE)}}{\text{CYCLES/HOUR}}$$

IF CYCLES ARE UNKNOWN ASSUME:

- UNIGNALIZED OR 2 PHASE = 60 CYCLES/HOUR
- 3 PHASE = 40 CYCLES/HOUR
- 4 PHASE = 30 CYCLES/HOUR

**Required Turn Lane Length Example Using Figures 401-9 and 401-10**



Traffic Control: Signalized  Design Speed: 50 mph  
 Cycle Length(s) = 120s (AM/PM)

**Determine Required Turn Lane Length (Queue + Deceleration)**

The required turn lane length is being calculated at a signalized intersection with a design speed of 50 mph; therefore, the storage will be based on Figure 401-9 Condition B or Condition C, whichever is greater.

**Calculate Required Turn Lane Length for AM Peak Hour**

- 1) Condition B = High speed deceleration only = 175 feet
- 2) Condition C = Queue Length (see calculations below) + Moderate Speed Deceleration = 200 feet + 100 feet = 300 feet.
- 3) Determine the left turn queue. Calculate the average number of vehicles per cycle for the turn lane. Round the answer up to the next whole number and determine the queue length per Figure 401-10. This length is shown in figure to the left in green.  $[(140 \text{ veh/hr}) \cdot (120 \text{ s/cyc})] / 3600 \text{ s/hr} = 4.7 \text{ veh/cyc} > 5 \text{ veh/cyc} > \underline{200 \text{ feet}}$ .
- 4) Determine thru/adjacent lane queue. Calculate the average number of vehicles per cycle for the thru/adjacent lane. Round the answer up to the next whole number and determine the queue length per Figure 401-10. This length is shown in figure to the left in blue.  $[(400 \text{ veh/hr}) \cdot (120 \text{ s/cyc})] / 3600 \text{ s/hr} = 13.3 \text{ veh/cyc} > 14 \text{ veh/cyc} > \underline{500 \text{ feet}}$ .
- 5) Compare the calculated lengths from Step 3 and Step 4. For this example the thru/adjacent lane queue (500 feet) is longer than the required left turn storage (300 feet); therefore, the left turn lane must be extended an additional 200 feet so left turning vehicles can enter the turn lane without being blocked by the thru/adjacent lane.
- 6) The required turn lane length of the left turn lane for the AM peak hour is **500 feet**.

**Calculate Required Turn Lane Length for PM Peak Hour**

- 1) Condition B = High speed deceleration only = 175 feet
- 2) Required turn lane storage for Condition C = Queue Length (see calculations below) + Moderate Speed Deceleration = 450 feet + 100 feet = 550 feet.
- 3) Determine the left turn queue. Calculate the average number of vehicles per cycle for the turn lane. Round the answer up to the next whole number and determine the queue length per Figure 401-10. This length is shown in figure to the left in green.  $[(340 \text{ veh/hr}) \cdot (120 \text{ s/cyc})] / 3600 \text{ s/hr} = 11.3 \text{ veh/cyc} > 12 \text{ veh/cyc} > \underline{450 \text{ feet}}$ .
- 4) Determine thru/adjacent lane queue. Calculate the average number of vehicles per cycle for the thru/adjacent lane. Round the answer up to the next whole number and determine the queue length per Figure 401-10. This length is shown in figure to the left in blue.  $[(160 \text{ veh/hr}) \cdot (120 \text{ s/cyc})] / 3600 \text{ s/hr} = 5.3 \text{ veh/cyc} > 6 \text{ veh/cyc} > \underline{250 \text{ feet}}$ .
- 5) Compare the calculated lengths from Step 3 and Step 4. For this example the thru/adjacent lane queue (250 feet) is shorter than the required left turn storage (550 feet); therefore, the left turn lane does not need to be extended so left turning vehicles can enter the turn lane without being blocked by the thru/adjacent lane.
- 6) The required turn lane length of the left turn lane for the PM peak hour is **550 feet**.

**Determine Required Storage of Turn Lane**

- 1) Per the AM and PM peak hour calculations the required turn lane length for the left turn lane is 500 feet and 550 feet, respectively.
- 2) The required turn lane length for the left turn lane is **550 feet**.
- 3) See PM Build figure to the left for the Final Design.

## **Appendix C**

### **Existing Traffic Signal Timing**

ORIGINAL	DRAWN BY	DATE	APPVD BY	CITY & LOCATION	PAGE NO.
REVIS	DF	11-20-08		North Ridgeville	
INTERSECTION#	01	TIMING PLAN #		Lorain @ Lear Kagle	
				BRAND Keon.	MMU
				MODEL ASU13+2100	(TS1) TS2

**CONTROLLER TIMING**

PHASE DESCRIPTION		RANGE	EBLT	WB	WBLT	SB	WBLT	EB	SBLT	NB
INTERVAL			01	02	03	04	05	06	07	08
1	INITIAL / MIN GREEN	0-255	7	7.0	7	10	7	2.0	7	10
2	PASSAGE / VEHICLE EXT	0-25.5	2.5	4.0	2.5	4.0	2.5	4.0	2.5	4.0
3	YELLOW	0-25.5	3.2	4.1	3.2	4.1	3.2	4.1	3.2	4.1
4	RED CLEAR	0-25.5	3.2	1.1	2.0	1.3	2.8	1.1	2.0	1.3
5	MAXIMUM 1	0-255	15	36	15	45	15	36	40	40
6	MAXIMUM 2	0-255	15	36	15	45	15	36	40	40
9	ADVANCE WALK	0-255								11
	WALK	0-255		9						29
9	PED CLEAR	7-255		17				1		
10	MIN. RECALL	0 OR 1		7						
11	MAX. RECALL	0 OR 1								
12	PED RECALL	0 OR 1								
13	NONLOCK	0 OR 1	1		1	1	1			1
14	CNA 1	0 OR 1		1						
15	CNA 2	0 OR 1								
16	FLASH WALK	0 OR 1								
17	PHASE OMIT	0 OR 1								
18	PED OMIT	0 OR 1								
25	SOFT RECALL	0 OR 1								
26	VOLUME DENSITY ACTIVE	0 OR 1								
27	ADD INITIAL	0-12.7								
28	MAX INITIAL	0-127								
29	TIME TO REDUCE	0-127								
30	TIME BEFORE REDUCTION	0-127								
31	MINIMUM GAP	0-12.7								

**SPECIAL FEATURES**

- SIGNAL OPERATES IN FREE MODE  N
- LEADING ARROW BACK-UP PROTECTION  Y
- 28 VOLUME DENSITY ACTIVE  N
- 29 START PHASE(S) AFTER U.C.F.  2-G
- 30 NORMAL START PHASE(S)  2-G
- 31 PHASE(S) PRIOR TO U.C.F.  4-G
- 95 SIMULTANEOUS GAP  Y
- 96 SEG. TIMING INITIAL & PASSAGE  Y
- HOLD PHASES  2-G
- LEFT TURN SIGNALS:  Y
- EXCLUSIVE CLUSTER  Y

**FLASH OR MAX II TIMES**  
none

**FLASH OR MAX II DAYS**

**FLASH COLORS**

PHASE 01	PHASE 05
PHASE 02	PHASE 06
PHASE 03	PHASE 07
PHASE 04	PHASE 08

PEDS. N & S ON E.S.  E & W ON N.S.

N & S ON W.S.  E & W ON S.S.

SPEED LIMIT: N.B. 35 S.B. 35 E.B. 35 W.B. 35

**LOOP DETECTOR DELAYS**

EBLT-0	SB-0
WBLT-0	SBLT-0
WB-0	LB-5
EB-0	NBLT-5

- OVERLAP PROGRAM
- OLA= 7
  - OLB=
  - OLC=
  - OLD=

**RECORD OF TRAFFIC SIGNAL OPERATION**

## **Appendix D**

### **Traffic Count Data**

# VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: North Ridgeville At Intersection of: Lorain Road (SR 10) and Lear Nagle Road / Cook Road  
 Date: 1/29/2025 Day: Wed. Comments: \_\_\_\_\_ Project: 24-153  
 Weather: Clear Recorder(s): DJS & KPB Data entry by: JJO Date entered: Jan. 30, 2025  
 Lorain Rd & Lear Nagle Cook Rd  
 012925

TIME BEGINS	Lear Nagle Rd. FROM NORTH						Cook Rd. FROM SOUTH						TOTAL NORTH SOUTH	Lorain Rd. (SR 10) FROM EAST						Lorain Rd. (SR 10) FROM WEST						TOTAL EAST WEST	TOTAL ALL DIREC.	PEAK HOUR FACTOR												
	Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus			North	South	East	West									
06:00																																								
07:00	554	220	196	970	8	1	91	162	70	323	8	1	1293	87	246	177	510	19	0	178	407	71	656	33	3	1166	2459	0.955	0.868	0.787	0.948									
08:00	438	108	143	689	12	2	114	155	65	334	6	0	1023	59	186	163	408	21	0	200	340	78	618	32	3	1026	2049	0.801	0.971	0.887	0.898									
09:00	272	100	97	469	11	0	62	127	46	235	10	0	704	43	173	181	397	41	1	124	277	64	465	34	2	862	1566	0.814	0.805	0.886	0.953									
10:00																																								
11:00	216	106	108	430	15	3	96	101	53	250	5	0	680	52	207	179	438	20	0	154	199	44	397	13	1	835	1515	0.779	0.762	0.890	0.769									
12:00	324	127	134	585	9	2	91	133	42	266	2	2	851	56	257	240	553	23	1	175	249	55	479	29	1	1032	1883	0.897	0.811	0.869	0.936									
1:00	342	131	139	612	16	1	60	109	42	211	4	0	823	58	233	226	517	20	0	128	177	37	342	27	2	859	1682	0.944	0.713	0.930	0.743									
2:00																																								
3:00	307	159	177	643	9	4	98	209	42	349	4	2	992	60	283	375	718	24	0	210	245	93	548	13	4	1266	2258	0.792	0.881	0.859	0.945									
4:00	374	192	187	753	9	3	100	175	43	318	3	1	1071	75	435	589	1099	15	0	247	328	88	663	17	1	1762	2833	0.876	0.820	0.853	0.877									
5:00	349	150	192	691	3	0	122	235	54	411	2	0	1102	94	349	513	956	4	0	237	330	71	638	15	0	1594	2696	0.890	0.893	0.912	0.802									
6:00																																								
7:00																																								
8:00																																								
9:00																																								
<b>TOTALS</b>	<b>3176</b>	<b>1293</b>	<b>1373</b>	<b>5842</b>	<b>92</b>	<b>16</b>	<b>834</b>	<b>1406</b>	<b>457</b>	<b>2697</b>	<b>44</b>	<b>6</b>	<b>8539</b>	<b>584</b>	<b>2369</b>	<b>2643</b>	<b>5596</b>	<b>187</b>	<b>2</b>	<b>1653</b>	<b>2552</b>	<b>601</b>	<b>4806</b>	<b>213</b>	<b>17</b>	<b>10402</b>	<b>18941</b>													
<b>ADT</b>	<b>4849</b>	<b>1974</b>	<b>2096</b>	<b>8920</b>	<b>1.8%</b>		<b>1273</b>	<b>2147</b>	<b>698</b>	<b>4118</b>	<b>1.9%</b>		<b>13038</b>	<b>919</b>	<b>3726</b>	<b>4157</b>	<b>8801</b>	<b>3.4%</b>		<b>2600</b>	<b>4014</b>	<b>945</b>	<b>7559</b>	<b>4.8%</b>		<b>16360</b>	<b>29398</b>													

N Leg Hourly Factor: <span style="border: 1px solid black; padding: 2px;">1.54</span> S Leg Hourly Factor: <span style="border: 1px solid black; padding: 2px;">1.54</span> N Leg Monthly Factor: <span style="border: 1px solid black; padding: 2px;">0.99</span> S Leg Monthly Factor: <span style="border: 1px solid black; padding: 2px;">0.99</span>	E Leg Hourly Factor: <span style="border: 1px solid black; padding: 2px;">1.58</span> W Leg Hourly Factor: <span style="border: 1px solid black; padding: 2px;">1.58</span> E Leg Monthly Factor: <span style="border: 1px solid black; padding: 2px;">0.99</span> W Leg Monthly Factor: <span style="border: 1px solid black; padding: 2px;">0.99</span>
--	--

N Leg Combined Factor: <span style="border: 1px solid black; padding: 2px;">1.53</span> S Leg Combined Factor: <span style="border: 1px solid black; padding: 2px;">1.53</span>	E Leg Combined Factor: <span style="border: 1px solid black; padding: 2px;">1.57</span> W Leg Combined Factor: <span style="border: 1px solid black; padding: 2px;">1.57</span>
--	--

**TMS ENGINEERS, INC.**  
 2112 Case Parkway South #7  
 Twinsburg, Ohio 44087  
 (330) 686-6402 FAX: (330) 686-6417

Figure #:  
  
Page #:

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

City: North Ridgeville  
Intersection: Lorain Rd & Lear Nagle + Cook Rd  
Counter: DJS & KPB  
Day of the Week: Wednesday

File Name : Lorain Rd and Lear Nagle Rd + Cook Rd 012925  
Site Code : 00000000  
Start Date : 1/29/2025  
Page No : 1

Groups Printed- Cars - Trucks - Busses

Start Time	LEAR NAGLE ROAD From North					LORAIN ROAD (SR 10) From East					COOK ROAD From South					LORAIN ROAD (SR 10) From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	45	57	141	0	243	40	48	11	0	99	24	41	25	0	90	13	107	31	0	151	583
07:15 AM	49	54	143	0	246	43	58	28	0	129	20	38	22	0	80	21	96	42	0	159	614
07:30 AM	51	47	156	0	254	50	84	28	0	162	14	48	31	0	93	17	107	49	0	173	682
07:45 AM	51	62	114	0	227	44	56	20	0	120	12	35	13	0	60	20	97	56	0	173	580
<b>Total</b>	196	220	554	0	970	177	246	87	0	510	70	162	91	0	323	71	407	178	0	656	2459
08:00 AM	29	28	94	0	151	51	51	10	0	112	16	44	25	0	85	16	95	61	0	172	520
08:15 AM	47	29	139	0	215	30	43	20	0	93	17	46	23	0	86	22	78	38	0	138	532
08:30 AM	36	29	127	0	192	47	53	15	0	115	16	31	35	0	82	25	88	40	0	153	542
08:45 AM	31	22	78	0	131	35	39	14	0	88	16	34	31	0	81	15	79	61	0	155	455
<b>Total</b>	143	108	438	0	689	163	186	59	0	408	65	155	114	0	334	78	340	200	0	618	2049
09:00 AM	34	28	82	0	144	46	38	15	0	99	7	33	15	0	55	13	68	32	0	113	411
09:15 AM	25	24	69	0	118	37	35	9	0	81	9	27	19	0	55	14	69	31	0	114	368
09:30 AM	20	20	55	0	95	55	51	6	0	112	18	39	16	1	74	7	76	33	0	116	397
09:45 AM	18	28	66	0	112	43	49	13	0	105	12	28	12	0	52	30	64	28	0	122	391
<b>Total</b>	97	100	272	0	469	181	173	43	0	397	46	127	62	1	236	64	277	124	0	465	1567
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

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

File Name : Lorain Rd and Lear Nagle Rd + Cook Rd 012925

Site Code : 00000000

Start Date : 1/29/2025

Page No : 2

Groups Printed- Cars - Trucks - Busses

Start Time	LEAR NAGLE ROAD From North					LORAIN ROAD (SR 10) From East					COOK ROAD From South					LORAIN ROAD (SR 10) From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	25	26	52	0	103	43	52	14	0	109	9	19	18	0	46	12	38	28	0	78	336
11:15 AM	31	21	49	0	101	50	50	15	0	115	18	27	31	0	76	13	53	31	0	97	389
11:30 AM	25	24	39	0	88	28	54	9	0	91	11	24	11	0	46	5	42	46	0	93	318
11:45 AM	27	35	76	0	138	58	51	14	0	123	15	31	36	0	82	14	66	49	0	129	472
Total	108	106	216	0	430	179	207	52	0	438	53	101	96	0	250	44	199	154	0	397	1515
12:00 PM	30	33	72	0	135	53	66	15	0	134	9	44	29	0	82	13	60	44	0	117	468
12:15 PM	34	31	98	0	163	52	65	20	0	137	13	26	28	0	67	15	58	46	0	119	486
12:30 PM	36	35	92	0	163	74	75	10	0	159	8	40	19	0	67	13	74	41	0	128	517
12:45 PM	34	28	62	0	124	61	51	11	0	123	12	23	15	0	50	14	57	44	0	115	412
Total	134	127	324	0	585	240	257	56	0	553	42	133	91	0	266	55	249	175	0	479	1883
01:00 PM	33	30	84	0	147	64	61	14	1	140	9	30	21	0	60	14	50	32	0	96	443
01:15 PM	30	34	78	0	142	47	51	9	1	108	18	26	16	0	60	9	55	51	0	115	425
01:30 PM	41	25	96	1	163	61	58	18	0	137	13	42	19	0	74	10	54	33	0	97	471
01:45 PM	35	42	84	0	161	54	63	17	0	134	2	11	4	0	17	4	18	12	0	34	346
Total	139	131	342	1	613	226	233	58	2	519	42	109	60	0	211	37	177	128	0	342	1685
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

File Name : Lorain Rd and Lear Nagle Rd + Cook Rd 012925

Site Code : 00000000

Start Date : 1/29/2025

Page No : 3

Groups Printed- Cars - Trucks - Busses

Start Time	LEAR NAGLE ROAD From North					LORAIN ROAD (SR 10) From East					COOK ROAD From South					LORAIN ROAD (SR 10) From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	47	40	83	0	170	90	54	13	0	157	8	40	19	0	67	21	58	49	1	129	523
03:15 PM	59	52	92	0	203	108	84	17	1	210	11	51	35	0	97	26	60	54	0	140	650
03:30 PM	37	31	69	0	137	96	70	17	0	183	12	64	23	0	99	26	59	60	0	145	564
03:45 PM	34	36	63	0	133	81	75	13	0	169	11	54	21	0	86	20	68	47	0	135	523
Total	177	159	307	0	643	375	283	60	1	719	42	209	98	0	349	93	245	210	1	549	2260
04:00 PM	38	45	99	0	182	97	74	8	0	179	6	40	29	0	75	18	78	61	0	157	593
04:15 PM	44	43	84	0	171	137	131	15	0	283	8	38	23	0	69	22	70	55	0	147	670
04:30 PM	52	60	103	0	215	178	113	24	0	315	12	41	24	0	77	28	98	63	0	189	796
04:45 PM	53	44	88	0	185	177	117	28	0	322	17	56	24	0	97	20	82	68	0	170	774
Total	187	192	374	0	753	589	435	75	0	1099	43	175	100	0	318	88	328	247	0	663	2833
05:00 PM	58	34	102	0	194	130	96	20	0	246	13	70	29	0	112	26	111	62	0	199	751
05:15 PM	53	36	92	0	181	143	88	31	0	262	19	61	35	0	115	21	84	80	0	185	743
05:30 PM	45	47	87	0	179	130	83	26	0	239	10	51	33	0	94	12	72	57	0	141	653
05:45 PM	36	33	68	0	137	110	82	17	0	209	12	53	25	0	90	12	63	38	0	113	549
Total	192	150	349	0	691	513	349	94	0	956	54	235	122	0	411	71	330	237	0	638	2696
Grand Total	1373	1293	3176	2	5844	2643	2369	584	3	5599	457	1406	834	1	2698	601	2552	1653	1	4807	18948
Apprch %	23.5	22.1	54.3	0		47.2	42.3	10.4	0.1		16.9	52.1	30.9	0		12.5	53.1	34.4	0		
Total %	7.2	6.8	16.8	0	30.8	13.9	12.5	3.1	0	29.5	2.4	7.4	4.4	0	14.2	3.2	13.5	8.7	0	25.4	
Cars	1333	1277	3124	2	5736	2598	2238	571	3	5410	444	1382	821	1	2648	587	2391	1598	1	4577	18371
% Cars	97.1	98.8	98.4	100	98.2	98.3	94.5	97.8	100	96.6	97.2	98.3	98.4	100	98.1	97.7	93.7	96.7	100	95.2	97
Trucks	31	11	50	0	92	44	130	13	0	187	12	20	12	0	44	13	158	42	0	213	536
% Trucks	2.3	0.9	1.6	0	1.6	1.7	5.5	2.2	0	3.3	2.6	1.4	1.4	0	1.6	2.2	6.2	2.5	0	4.4	2.8
Busses	9	5	2	0	16	1	1	0	0	2	1	4	1	0	6	1	3	13	0	17	41

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

% Busses | 0.7 0.4 0.1 0 0.3 | 0 0 0 0 0 | 0.2 0.3 0.1 0 0.2 | 0.2 0.1 0.8 0 0.4 | 0.2

Start Time	LEAR NAGLE ROAD From North					LORAIN ROAD (SR 10) From East					COOK ROAD From South					LORAIN ROAD (SR 10) From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	45	57	141	0	243	40	48	11	0	99	<b>24</b>	41	25	0	90	13	<b>107</b>	31	0	151	583
07:15 AM	49	54	143	0	246	43	58	<b>28</b>	0	129	20	38	22	0	80	<b>21</b>	96	42	0	159	614
07:30 AM	<b>51</b>	47	<b>156</b>	0	<b>254</b>	<b>50</b>	<b>84</b>	28	0	<b>162</b>	14	<b>48</b>	<b>31</b>	0	<b>93</b>	17	107	49	0	<b>173</b>	<b>682</b>
07:45 AM	51	<b>62</b>	114	0	227	44	56	20	0	120	12	35	13	0	60	20	97	<b>56</b>	0	173	580
Total Volume	196	220	554	0	970	177	246	87	0	510	70	162	91	0	323	71	407	178	0	656	2459
% App. Total	20.2	22.7	57.1	0		34.7	48.2	17.1	0		21.7	50.2	28.2	0		10.8	62	27.1	0		
PHF	.961	.887	.888	.000	.955	.885	.732	.777	.000	.787	.729	.844	.734	.000	.868	.845	.951	.795	.000	.948	.901
Cars	195	217	549	0	961	175	231	85	0	491	67	159	88	0	314	70	381	169	0	620	2386
% Cars	99.5	98.6	99.1	0	99.1	98.9	93.9	97.7	0	96.3	95.7	98.1	96.7	0	97.2	98.6	93.6	94.9	0	94.5	97.0
Trucks	1	2	5	0	8	2	15	2	0	19	3	2	3	0	8	1	26	6	0	33	68
% Trucks	0.5	0.9	0.9	0	0.8	1.1	6.1	2.3	0	3.7	4.3	1.2	3.3	0	2.5	1.4	6.4	3.4	0	5.0	2.8
Busses	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	5
% Busses	0	0.5	0	0	0.1	0	0	0	0	0	0	0.6	0	0	0.3	0	0	1.7	0	0.5	0.2

Peak Hour Analysis From 11:45 AM to 12:30 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:45 AM

11:45 AM	27	<b>35</b>	76	0	138	58	51	14	0	123	<b>15</b>	31	<b>36</b>	0	<b>82</b>	14	66	<b>49</b>	0	<b>129</b>	472
12:00 PM	30	33	72	0	135	53	66	15	0	134	9	<b>44</b>	29	0	82	13	60	44	0	117	468
12:15 PM	34	31	<b>98</b>	0	<b>163</b>	52	65	<b>20</b>	0	137	13	26	28	0	67	<b>15</b>	58	46	0	119	486
12:30 PM	<b>36</b>	35	92	0	163	<b>74</b>	<b>75</b>	10	0	<b>159</b>	8	40	19	0	67	13	<b>74</b>	41	0	128	<b>517</b>
Total Volume	127	134	338	0	599	237	257	59	0	553	45	141	112	0	298	55	258	180	0	493	1943
% App. Total	21.2	22.4	56.4	0		42.9	46.5	10.7	0		15.1	47.3	37.6	0		11.2	52.3	36.5	0		
PHF	.882	.957	.862	.000	.919	.801	.857	.738	.000	.869	.750	.801	.778	.000	.909	.917	.872	.918	.000	.955	.940
Cars	120	131	333	0	584	233	245	58	0	536	44	139	110	0	293	54	241	174	0	469	1882
% Cars	94.5	97.8	98.5	0	97.5	98.3	95.3	98.3	0	96.9	97.8	98.6	98.2	0	98.3	98.2	93.4	96.7	0	95.1	96.9
Trucks	5	2	5	0	12	3	12	1	0	16	1	2	1	0	4	1	17	4	0	22	54
% Trucks	3.9	1.5	1.5	0	2.0	1.3	4.7	1.7	0	2.9	2.2	1.4	0.9	0	1.3	1.8	6.6	2.2	0	4.5	2.8
Busses	2	1	0	0	3	1	0	0	0	1	0	0	1	0	1	0	0	2	0	2	7
% Busses	1.6	0.7	0	0	0.5	0.4	0	0	0	0.2	0	0	0.9	0	0.3	0	0	1.1	0	0.4	0.4

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

File Name : Lorain Rd and Lear Nagle Rd + Cook Rd 012925

Site Code : 00000000

Start Date : 1/29/2025

Page No : 5

Start Time	LEAR NAGLE ROAD From North					LORAIN ROAD (SR 10) From East					COOK ROAD From South					LORAIN ROAD (SR 10) From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	52	<b>60</b>	<b>103</b>	0	<b>215</b>	<b>178</b>	113	24	0	315	12	41	24	0	77	<b>28</b>	98	63	0	189	<b>796</b>
04:45 PM	53	44	88	0	185	177	<b>117</b>	28	0	<b>322</b>	17	56	24	0	97	20	82	68	0	170	774
05:00 PM	<b>58</b>	34	102	0	194	130	96	20	0	246	13	<b>70</b>	29	0	112	26	<b>111</b>	62	0	<b>199</b>	751
05:15 PM	53	36	92	0	181	143	88	<b>31</b>	0	262	<b>19</b>	61	<b>35</b>	0	<b>115</b>	21	84	<b>80</b>	0	185	743
Total Volume	216	174	385	0	775	628	414	103	0	1145	61	228	112	0	401	95	375	273	0	743	3064
% App. Total	27.9	22.5	49.7	0		54.8	36.2	9	0		15.2	56.9	27.9	0		12.8	50.5	36.7	0		
PHF	.931	.725	.934	.000	.901	.882	.885	.831	.000	.889	.803	.814	.800	.000	.872	.848	.845	.853	.000	.933	.962
Cars	214	173	380	0	767	626	407	102	0	1135	61	226	111	0	398	94	365	268	0	727	3027
% Cars	99.1	99.4	98.7	0	99.0	99.7	98.3	99.0	0	99.1	100	99.1	99.1	0	99.3	98.9	97.3	98.2	0	97.8	98.8
Trucks	1	0	4	0	5	2	7	1	0	10	0	1	1	0	2	1	10	5	0	16	33
% Trucks	0.5	0	1.0	0	0.6	0.3	1.7	1.0	0	0.9	0	0.4	0.9	0	0.5	1.1	2.7	1.8	0	2.2	1.1
Busses	1	1	1	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
% Busses	0.5	0.6	0.3	0	0.4	0	0	0	0	0	0	0.4	0	0	0.2	0	0	0	0	0	0.1



# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

City: North Ridgeville  
Intersection: Cook Rd & Starbuck's  
Counter: DJS  
Day of the Week: Thursday

File Name : TC 2 Cook Rd and Starbuck Driveway 013025  
Site Code : 00000000  
Start Date : 1/30/2025  
Page No : 1

Groups Printed- Cars - Trucks - Buses

Start Time	STARBUCK DRIVEWAY From North					COOK ROAD From East					STARBUCK DRIVEWAY From South					COOK ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	52	3	0	55	7	0	23	0	30	21	40	0	0	61	146
07:15 AM	0	0	0	0	0	0	68	6	0	74	9	0	27	0	36	26	39	0	0	65	175
07:30 AM	0	0	0	0	0	0	71	11	0	82	17	0	21	0	38	31	73	0	1	105	225
07:45 AM	0	0	0	0	0	0	59	6	0	65	12	0	34	0	46	25	54	0	0	79	190
Total	0	0	0	0	0	0	250	26	0	276	45	0	105	0	150	103	206	0	1	310	736
08:00 AM	0	0	0	0	0	0	70	8	0	78	9	0	19	0	28	23	63	0	0	86	192
08:15 AM	0	0	0	0	0	0	63	6	0	69	11	0	17	0	28	32	51	0	0	83	180
08:30 AM	0	0	0	0	0	0	74	4	0	78	11	0	28	0	39	26	53	0	0	79	196
08:45 AM	0	0	0	0	0	0	56	5	0	61	11	0	23	0	34	19	57	0	0	76	171
Total	0	0	0	0	0	0	263	23	0	286	42	0	87	0	129	100	224	0	0	324	739
09:00 AM	0	0	0	0	0	0	57	1	0	58	2	0	16	0	18	17	42	0	0	59	135
09:15 AM	0	0	0	0	0	0	44	6	0	50	4	0	9	0	13	16	38	0	0	54	117
09:30 AM	0	0	0	0	0	0	33	2	0	35	5	0	20	0	25	19	39	0	0	58	118
09:45 AM	0	0	0	0	0	0	31	3	0	34	4	0	11	0	15	14	35	0	0	49	98
Total	0	0	0	0	0	0	165	12	0	177	15	0	56	0	71	66	154	0	0	220	468
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

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

File Name : TC 2 Cook Rd and Starbuck Driveway 013025

Site Code : 00000000

Start Date : 1/30/2025

Page No : 2

Groups Printed- Cars - Trucks - Buses

Start Time	STARBUCK DRIVEWAY From North					COOK ROAD From East					STARBUCK DRIVEWAY From South					COOK ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	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	64	4	0	68	4	0	14	0	18	12	42	0	0	54	140
11:15 AM	0	0	0	0	0	0	61	0	0	61	1	0	8	0	9	16	35	0	0	51	121
11:30 AM	0	0	0	0	0	0	56	1	0	57	5	0	9	0	14	10	44	0	0	54	125
11:45 AM	0	0	0	0	0	0	64	4	0	68	5	0	9	0	14	13	40	0	0	53	135
Total	0	0	0	0	0	0	245	9	0	254	15	0	40	0	55	51	161	0	0	212	521
12:00 PM	0	0	0	0	0	0	85	0	0	85	13	0	10	0	23	11	53	0	0	64	172
12:15 PM	0	0	0	0	0	0	81	0	0	81	5	0	9	0	14	12	63	0	0	75	170
12:30 PM	0	0	0	0	0	0	78	4	0	82	6	0	8	0	14	6	52	0	0	58	154
12:45 PM	0	0	0	0	0	0	66	3	0	69	3	0	7	0	10	8	59	0	0	67	146
Total	0	0	0	0	0	0	310	7	0	317	27	0	34	0	61	37	227	0	0	264	642
01:00 PM	0	0	0	0	0	0	64	5	0	69	2	0	9	0	11	13	57	0	0	70	150
01:15 PM	0	0	0	0	0	0	64	3	0	67	3	0	7	0	10	5	55	0	0	60	137
01:30 PM	0	0	0	0	0	0	74	4	0	78	4	0	12	0	16	9	53	0	2	64	158
01:45 PM	0	0	0	0	0	0	64	6	0	70	8	0	6	0	14	8	59	0	0	67	151
Total	0	0	0	0	0	0	266	18	0	284	17	0	34	0	51	35	224	0	2	261	596
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

File Name : TC 2 Cook Rd and Starbuck Driveway 013025

Site Code : 00000000

Start Date : 1/30/2025

Page No : 3

Groups Printed- Cars - Trucks - Buses

Start Time	STARBUCK DRIVEWAY From North					COOK ROAD From East					STARBUCK DRIVEWAY From South					COOK ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	68	5	0	73	5	0	13	0	18	10	47	0	0	57	148
03:15 PM	0	0	0	0	0	0	72	0	0	72	6	0	6	0	12	9	51	0	0	60	144
03:30 PM	0	0	0	0	0	0	74	9	0	83	7	0	8	0	15	14	79	0	0	93	191
03:45 PM	0	0	0	0	0	0	75	1	0	76	5	0	9	0	14	12	97	0	0	109	199
Total	0	0	0	0	0	0	289	15	0	304	23	0	36	0	59	45	274	0	0	319	682
04:00 PM	0	0	0	0	0	0	99	0	0	99	3	0	11	0	14	16	81	0	0	97	210
04:15 PM	0	0	0	0	0	0	83	4	0	87	5	0	10	0	15	9	74	0	0	83	185
04:30 PM	0	0	0	0	0	0	69	3	0	72	4	0	4	0	8	4	97	0	0	101	181
04:45 PM	0	0	0	0	0	0	121	1	0	122	6	0	6	0	12	10	80	0	0	90	224
Total	0	0	0	0	0	0	372	8	0	380	18	0	31	0	49	39	332	0	0	371	800
05:00 PM	0	0	0	0	0	0	93	1	0	94	4	0	2	0	6	7	89	0	0	96	196
05:15 PM	0	0	0	0	0	0	101	2	0	103	5	0	4	0	9	7	95	0	0	102	214
05:30 PM	0	0	0	0	0	0	88	0	0	88	1	0	8	0	9	9	75	0	0	84	181
05:45 PM	0	0	0	0	0	0	116	1	0	117	0	0	7	0	7	7	51	0	0	58	182
Total	0	0	0	0	0	0	398	4	0	402	10	0	21	0	31	30	310	0	0	340	773
Grand Total	0	0	0	0	0	0	2558	122	0	2680	212	0	444	0	656	506	2112	0	3	2621	5957
Apprch %	0	0	0	0	0	0	95.4	4.6	0		32.3	0	67.7	0		19.3	80.6	0	0.1		
Total %	0	0	0	0	0	0	42.9	2	0	45	3.6	0	7.5	0	11	8.5	35.5	0	0.1	44	
Cars	0	0	0	0	0	0	2519	122	0	2641	211	0	444	0	655	504	2075	0	3	2582	5878
% Cars	0	0	0	0	0	0	98.5	100	0	98.5	99.5	0	100	0	99.8	99.6	98.2	0	100	98.5	98.7
Trucks	0	0	0	0	0	0	35	0	0	35	1	0	0	0	1	2	34	0	0	36	72
% Trucks	0	0	0	0	0	0	1.4	0	0	1.3	0.5	0	0	0	0.2	0.4	1.6	0	0	1.4	1.2
Buses	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

% Buses | 0 0 0 0 0 | 0 0.2 0 0 0.1 | 0 0 0 0 0 | 0 0.1 0 0 0.1 | 0.1

Start Time	STARBUCK DRIVEWAY From North					COOK ROAD From East					STARBUCK DRIVEWAY From South					COOK ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	0	0	0	0	0	0	52	3	0	55	7	0	23	0	30	21	40	0	0	61	146
07:15 AM	0	0	0	0	0	0	68	6	0	74	9	0	27	0	36	26	39	0	0	65	175
07:30 AM	0	0	0	0	0	0	<b>71</b>	<b>11</b>	0	<b>82</b>	<b>17</b>	0	21	0	38	<b>31</b>	<b>73</b>	0	<b>1</b>	<b>105</b>	<b>225</b>
07:45 AM	0	0	0	0	0	0	59	6	0	65	12	0	<b>34</b>	0	<b>46</b>	25	54	0	0	79	190
Total Volume	0	0	0	0	0	0	250	26	0	276	45	0	105	0	150	103	206	0	1	310	736
% App. Total	0	0	0	0	0	0	90.6	9.4	0	99.3	30	0	70	0	100	33.2	66.5	0	0.3	97.7	98.8
PHF	.000	.000	.000	.000	.000	.000	.880	.591	.000	.841	.662	.000	.772	.000	.815	.831	.705	.000	.250	.738	.818
Cars	0	0	0	0	0	0	248	26	0	274	45	0	105	0	150	103	199	0	1	303	727
% Cars	0	0	0	0	0	0	99.2	100	0	99.3	100	0	100	0	100	100	96.6	0	100	97.7	98.8
Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	7	0	0	7	9
% Trucks	0	0	0	0	0	0	0.8	0	0	0.7	0	0	0	0	0	0	3.4	0	0	2.3	1.2
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Hour Analysis From 11:45 AM to 12:30 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:45 AM

11:45 AM	0	0	0	0	0	0	64	<b>4</b>	0	68	5	0	9	0	14	<b>13</b>	40	0	0	53	135
12:00 PM	0	0	0	0	0	0	<b>85</b>	0	0	<b>85</b>	<b>13</b>	0	<b>10</b>	0	<b>23</b>	11	53	0	0	64	<b>172</b>
12:15 PM	0	0	0	0	0	0	81	0	0	81	5	0	9	0	14	12	<b>63</b>	0	0	<b>75</b>	170
12:30 PM	0	0	0	0	0	0	78	4	0	82	6	0	8	0	14	6	52	0	0	58	154
Total Volume	0	0	0	0	0	0	308	8	0	316	29	0	36	0	65	42	208	0	0	250	631
% App. Total	0	0	0	0	0	0	97.5	2.5	0	99.1	44.6	0	55.4	0	100	16.8	83.2	0	0	98.0	98.7
PHF	.000	.000	.000	.000	.000	.000	.906	.500	.000	.929	.558	.000	.900	.000	.707	.808	.825	.000	.000	.833	.917
Cars	0	0	0	0	0	0	305	8	0	313	29	0	36	0	65	42	203	0	0	245	623
% Cars	0	0	0	0	0	0	99.0	100	0	99.1	100	0	100	0	100	100	97.6	0	0	98.0	98.7
Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	8
% Trucks	0	0	0	0	0	0	1.0	0	0	0.9	0	0	0	0	0	0	2.4	0	0	2.0	1.3
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# TMS Engineers, Inc.

2112 Case Pkwy. S. #7  
Twinsburg, Ohio 44087

*Transportation Management Services*

File Name : TC 2 Cook Rd and Starbuck Driveway 013025

Site Code : 00000000

Start Date : 1/30/2025

Page No : 5

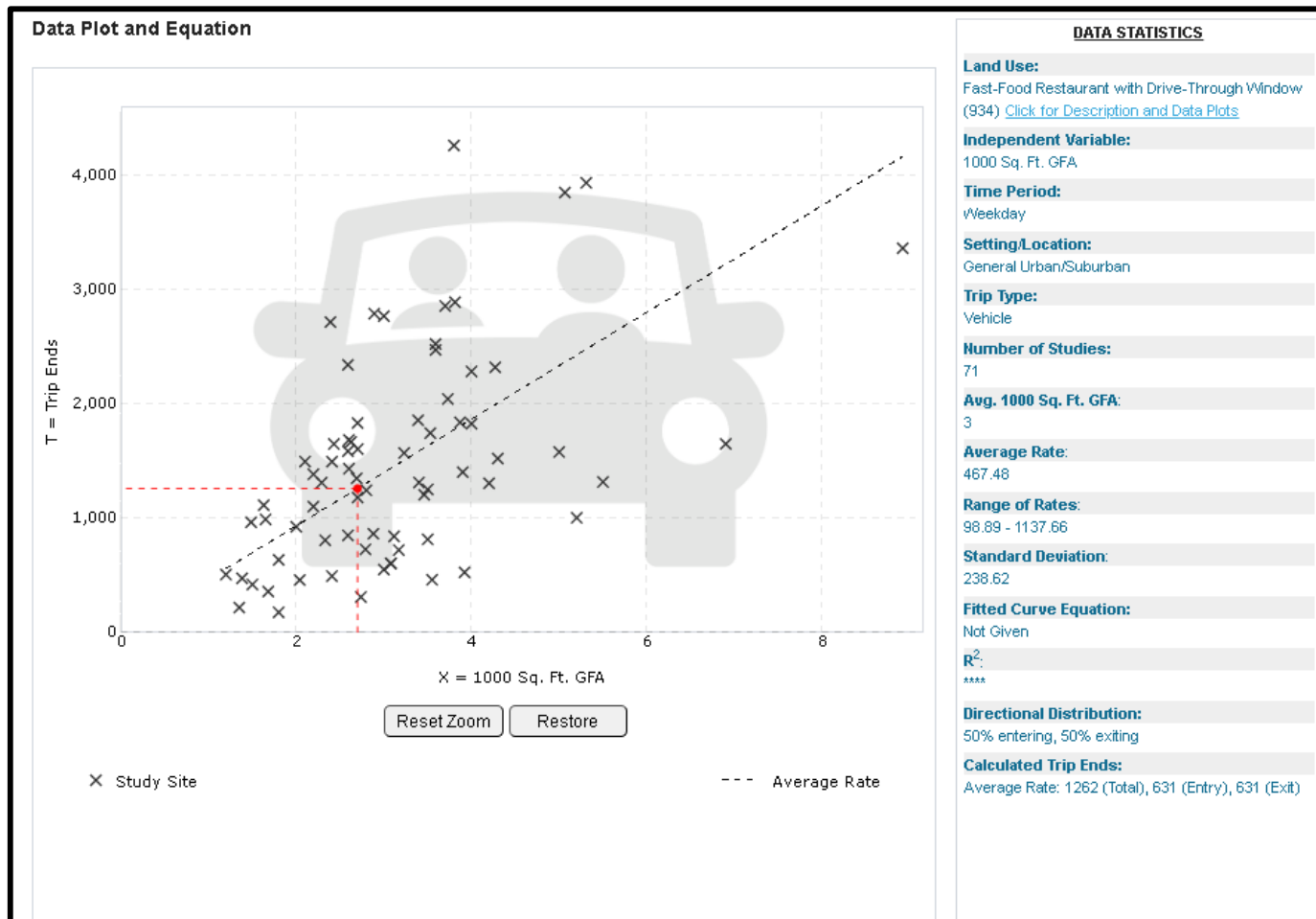
Start Time	STARBUCK DRIVEWAY From North					COOK ROAD From East					STARBUCK DRIVEWAY From South					COOK ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	69	3	0	72	4	0	4	0	8	4	97	0	0	101	181
04:45 PM	0	0	0	0	0	0	121	1	0	122	6	0	6	0	12	10	80	0	0	90	224
05:00 PM	0	0	0	0	0	0	93	1	0	94	4	0	2	0	6	7	89	0	0	96	196
05:15 PM	0	0	0	0	0	0	101	2	0	103	5	0	4	0	9	7	95	0	0	102	214
Total Volume	0	0	0	0	0	0	384	7	0	391	19	0	16	0	35	28	361	0	0	389	815
% App. Total	0	0	0	0		0	98.2	1.8	0		54.3	0	45.7	0		7.2	92.8	0	0		
PHF	.000	.000	.000	.000	.000	.000	.793	.583	.000	.801	.792	.000	.667	.000	.729	.700	.930	.000	.000	.953	.910
Cars	0	0	0	0	0	0	378	7	0	385	19	0	16	0	35	28	358	0	0	386	806
% Cars	0	0	0	0	0	0	98.4	100	0	98.5	100	0	100	0	100	100	99.2	0	0	99.2	98.9
Trucks	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	7
% Trucks	0	0	0	0	0	0	1.3	0	0	1.3	0	0	0	0	0	0	0.6	0	0	0.5	0.9
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Buses	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0	0.3	0	0	0.3	0.2

## **Appendix E**

### **Trip Generation Data**

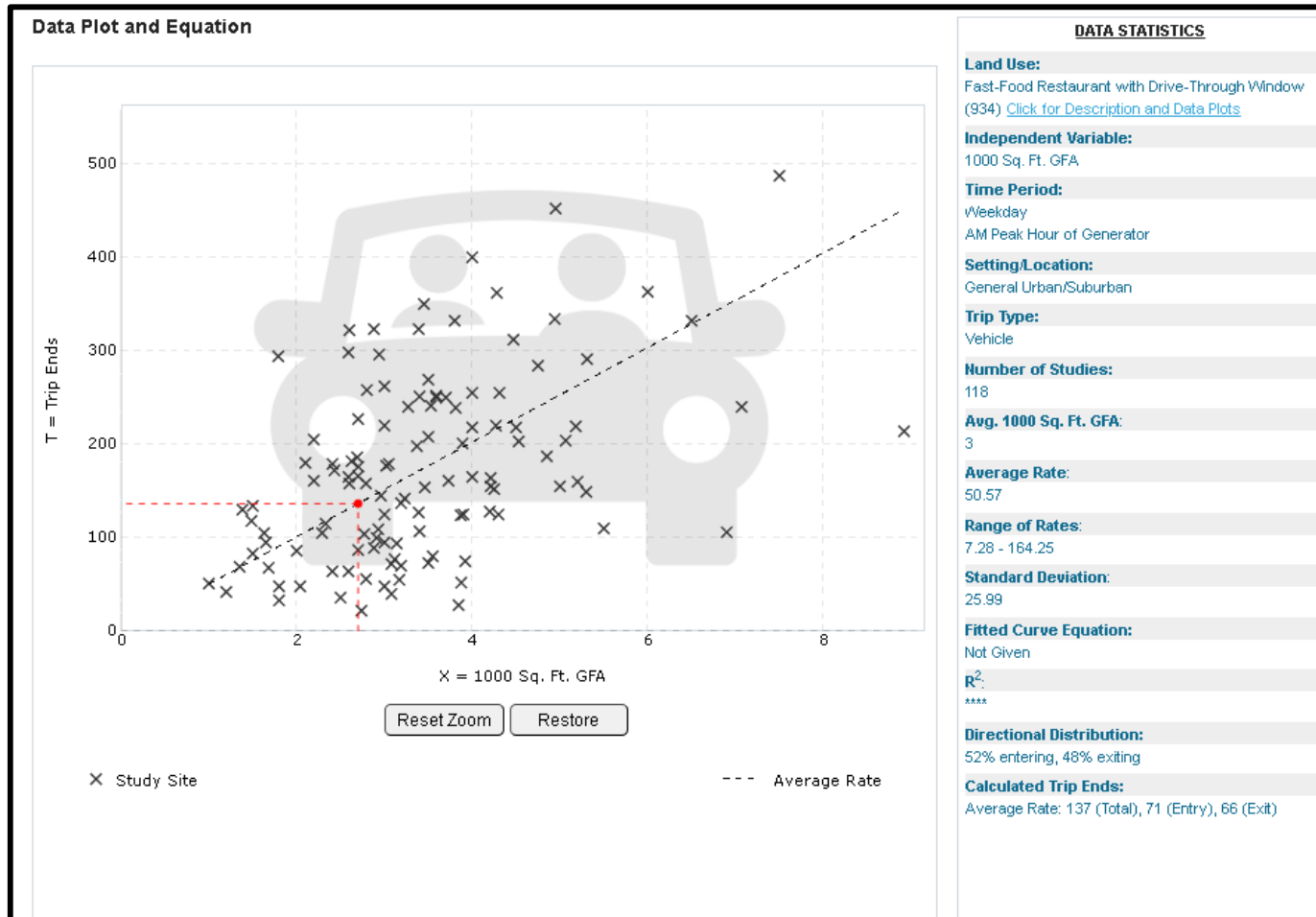
**Fast Food Restaurant with Drive-Through Window**  
**ITE Code #934**  
**Size: 2,700 SQFT**

**WEEKDAY**  
**Weekday**



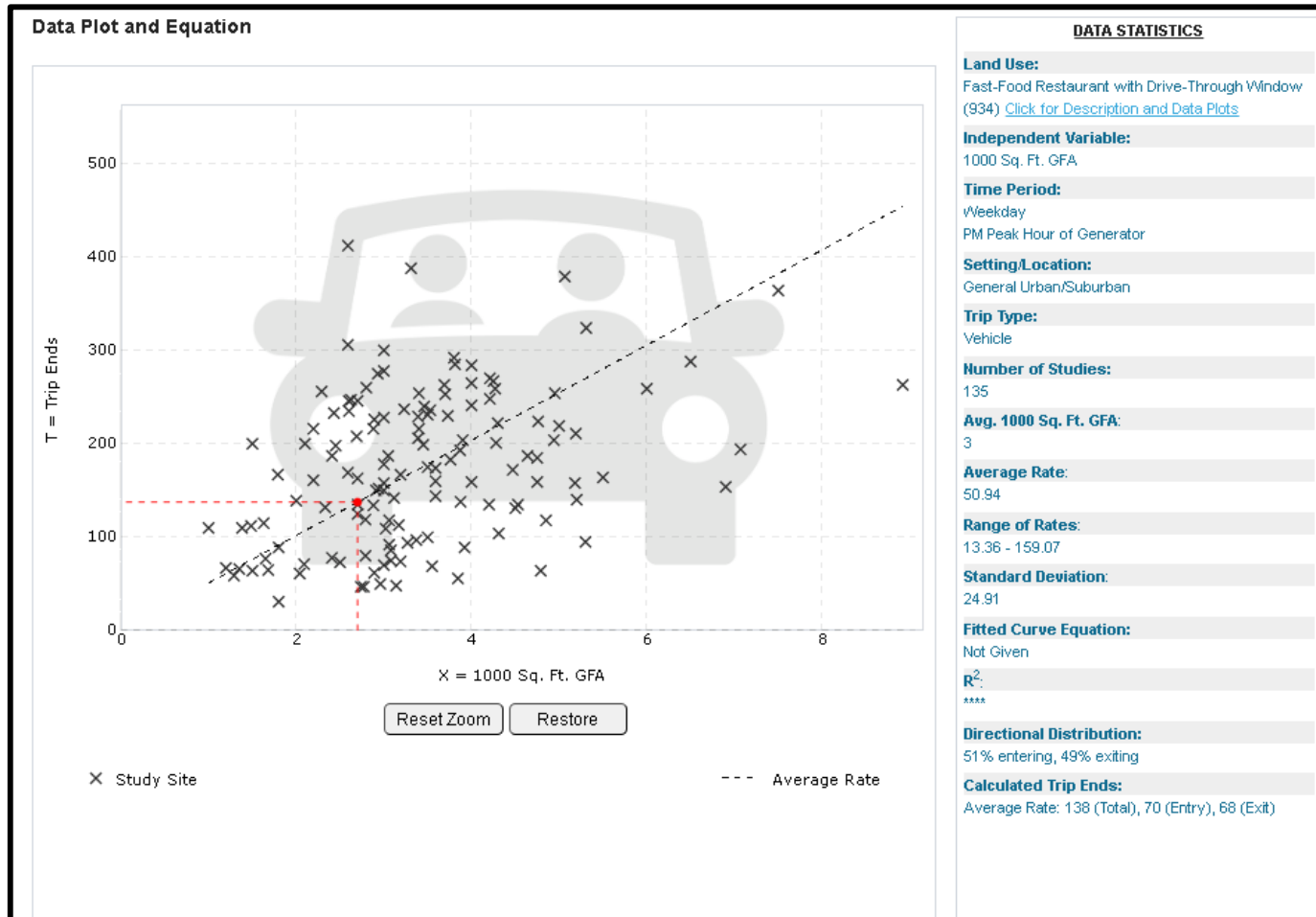
**Fast Food Restaurant with Drive-Through Window**  
**ITE Code #934**  
**Size: 2,700 SQFT**

**WEEKDAY**  
**AM Peak Hour of Generator**



**Fast Food Restaurant with Drive-Through Window**  
**ITE Code #934**  
**Size: 2,700 SQFT**

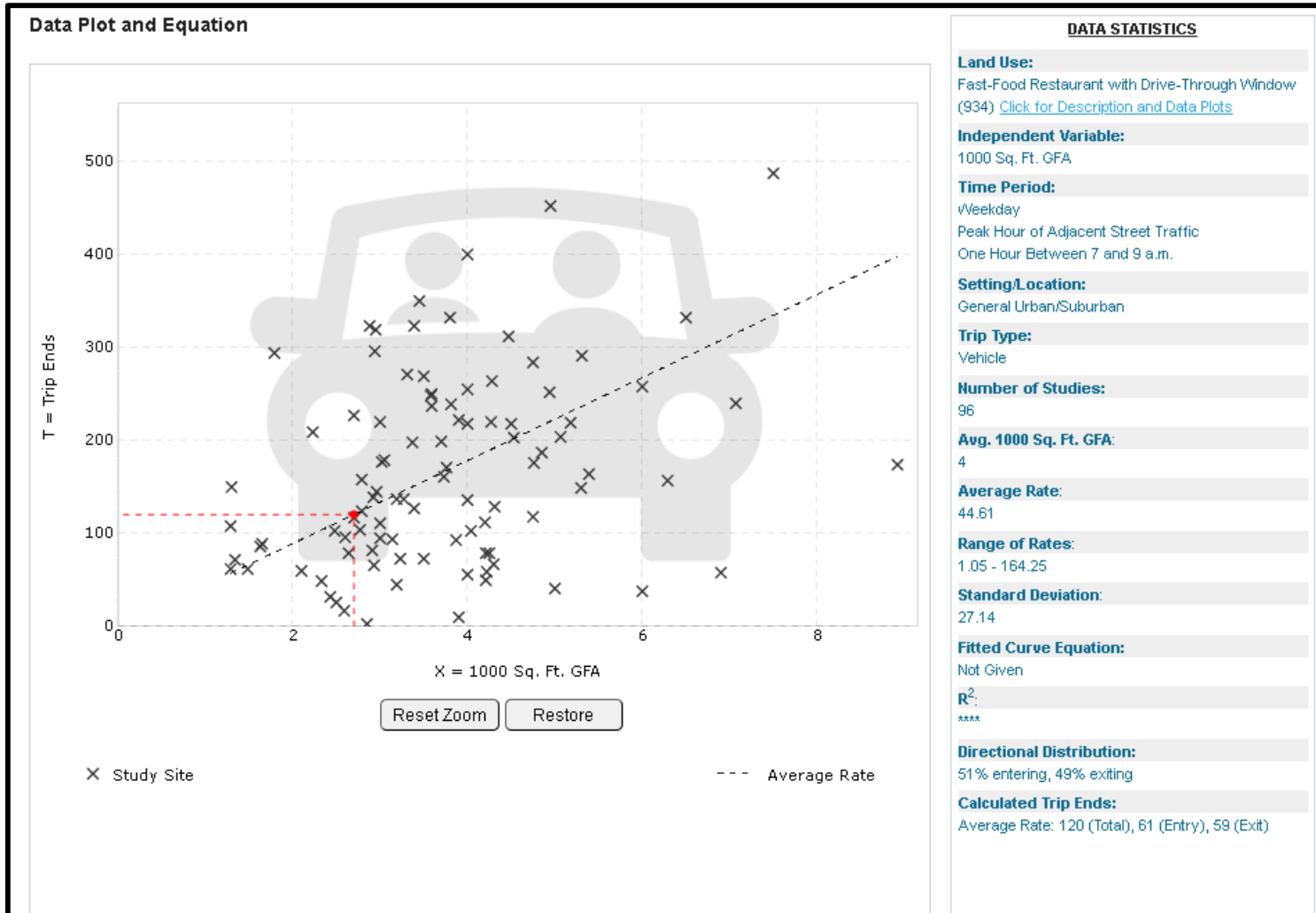
**WEEKDAY**  
**PM Peak Hour of Generator**



**Fast Food Restaurant with Drive-Through Window**  
**ITE Code #934**  
**Size: 2,700 SQFT**

**WEEKDAY**

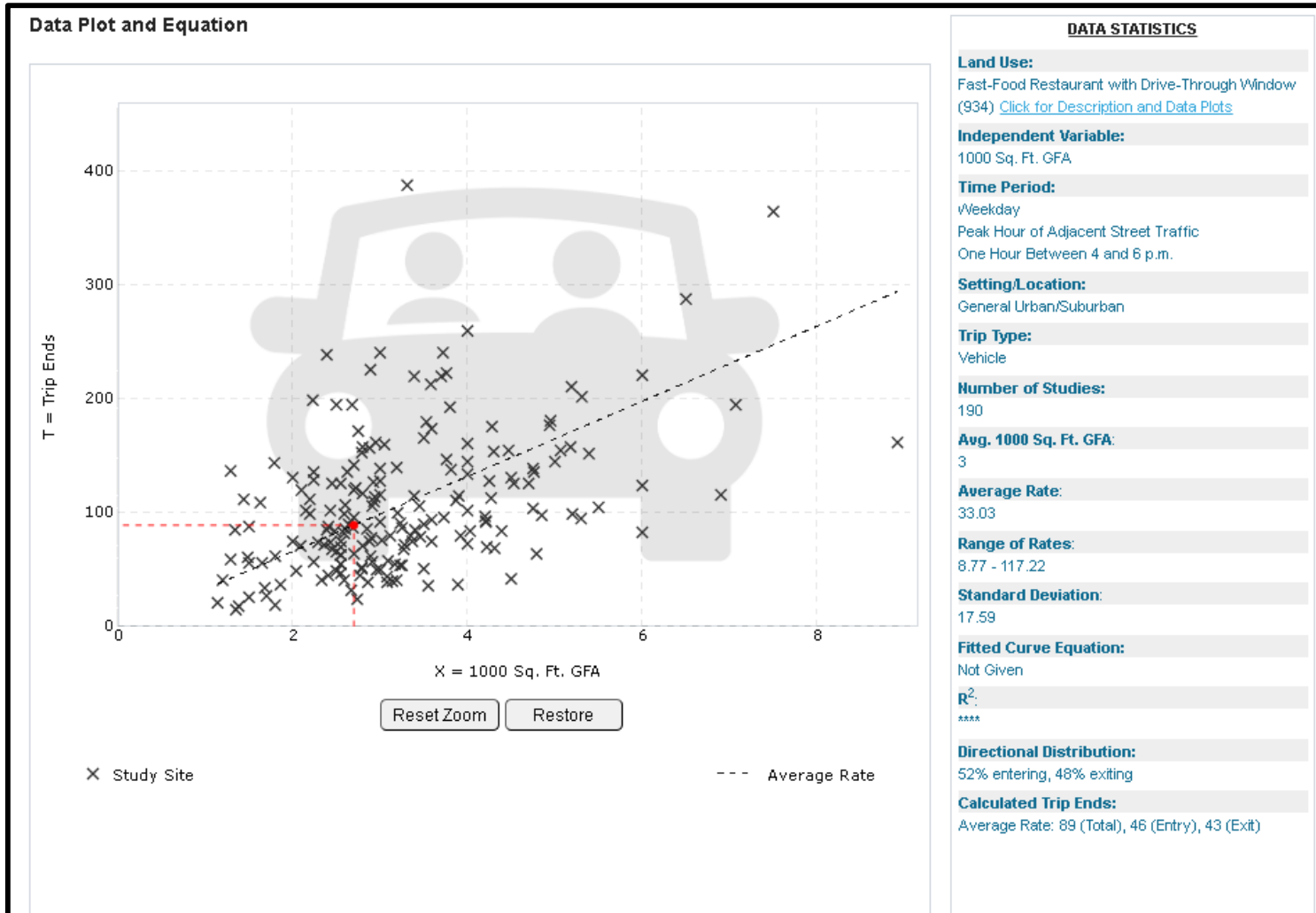
**Peak Hour of Adjacent Street Traffic: 7-9 AM**



**Fast Food Restaurant with Drive-Through Window**  
**ITE Code #934**  
**Size: 2,700 SQFT**

**WEEKDAY**

**Peak Hour of Adjacent Street Traffic: 4-6 PM**



### Vehicle Pass-By Rates by Land Use

Source: ITE *Trip Generation Manual*, 11th Edition

Land Use Code	934								
Land Use	Fast-Food Restaurant with Drive-Through Window								
Setting	General Urban/Suburban								
Time Period	Weekday PM Peak Period								
# Data Sites	11								
Average Pass-By Rate	55%								
	Pass-By Characteristics for Individual Sites								
	GFA (000)	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume
					Primary (%)	Diverted (%)	Total (%)		
1.3	Kentucky	1993	—	68	22	10	32	2055	2
1.9	Kentucky	1993	33	67	24	9	33	2447	2
2.8	Florida	1995	47	66	—	—	34	—	30
2.9	Florida	1996	271	41	41	18	59	—	30
3	Kentucky	1993	—	31	31	38	69	4250	2
3.1	Florida	1995	28	71	—	—	29	—	30
3.1	Florida	1996	29	38	—	—	62	—	30
3.2	Florida	1996	202	40	39	21	60	—	30
3.3	—	1996	—	62	—	—	38	—	21
4.2	Indiana	1993	—	56	25	19	44	1632	2
4.3	Florida	1994	304	62	—	—	38	—	30

## **Appendix F**

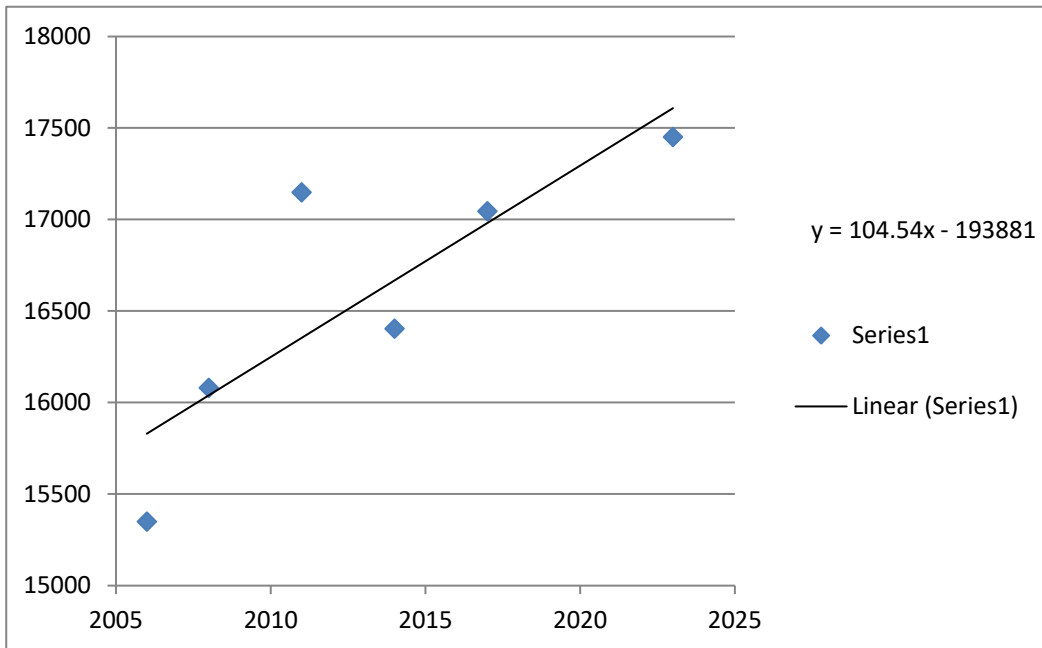
### **ODOT Historical Data & Calculations**

# WORKSHEET FOR E-W GROWTH RATES

**LORAIN ROAD ID 7147 - COUNT DATA FROM ODOT WEBSITE  
SR 10 SPUR NORTHEAST OF OHIO TURNPIKE, IN NORTH RIDGEVILLE**

Year	Volume	% Diff per Yr to Prev Yr Count	% Diff per Yr Since 2023	AVG/YEAR Since
2023	17451	0.40%		<b>2006</b>
2017	17045	1.30%	0.40%	<b>0.805%</b>
2014	16404	-1.45%	0.71%	
2011	17148	2.21%	0.15%	<b>AVG/YEAR Since</b>
2008	16080	2.38%	0.57%	<b>2011</b>
2006	15350		1.00%	<b>0.15%</b>
				<b>AVG/YEAR Since</b>
				<b>2017</b>
				<b>0.40%</b>

<b>Coefficient (b) of Regression Equation:</b>	<b>104.542</b>
Growth Rate =	b / Most Recent Count x 100%
Growth Rate =	104.542 / 17451 X 100%
<b>Growth Rate =</b>	<b>0.5991%</b>



## **Appendix G**

### **ODOT Peak Hour to Design Hour Charts**

**PEAK HOUR to DESIGN HOUR FACTORS**  
**FUNCTIONAL CLASSIFICATION = 03, 04, 05u**  
 (Urban Principal Arterial, Urban Minor Arterial, & Urban Minor Collector)

Day Month		Monthly Average by Day-of-Week							
		WEEKDAY MON-THUR	Sun	Mon	Tue	Wed	Thu	Fri	Sat
		0	1	2	3	4	5	6	7
January	1	1.25	1.81	1.27	1.25	1.25	1.23	1.18	1.61
February	2	1.23	1.78	1.26	1.23	1.23	1.19	1.17	1.58
March	3	1.18	1.63	1.20	1.18	1.17	1.17	1.12	1.47
April	4	1.13	1.57	1.15	1.14	1.12	1.11	1.08	1.42
May	5	1.10	1.47	1.12	1.10	1.10	1.07	1.06	1.35
June	6	1.14	1.51	1.16	1.14	1.14	1.11	1.10	1.40
July	7	1.14	1.54	1.16	1.14	1.13	1.14	1.11	1.45
August	8	1.12	1.49	1.14	1.14	1.12	1.10	1.06	1.41
September	9	1.12	1.53	1.15	1.13	1.13	1.09	1.05	1.42
October	10	1.12	1.54	1.15	1.12	1.11	1.10	1.05	1.42
November	11	1.16	1.63	1.17	1.15	1.15	1.15	1.08	1.52
December	12	1.16	1.61	1.18	1.16	1.16	1.13	1.10	1.50

peak hour volume \* factor = design hour volume

source: year 2018, 2019, & 2021 Automatic Traffic Recorders (ATR) Data

ATR Stations:

2018: 15 Stations  
 2019: 21 Stations  
 2021: 22 Stations

Ohio Department of Transportation  
 Modeling & Forecasting Section  
 Nov-22

**NOTE: These are NOT seasonal adjustment factors!!!**

**NOTE: Factors shown rounded to 2 decimal places. Unrounded value will be used in calculations.**

Note: Insufficient data exists to produce factors for functional classes 06 and 07 Urban.

## **Appendix H**

### **Background Traffic Volume Forecast Calculations**

# WORKSHEET FOR NO BUILD VEHICULAR TRAFFIC VOLUME CALCULATIONS

Lorain Rd & Lear Nagle Cook Rd 012925

		Lear Nagle Rd. FROM NORTH					Cook Rd. FROM SOUTH					TOTAL NORTH SOUTH	Lorain Rd. (SR 10) FROM EAST					Lorain Rd. (SR 10) FROM WEST					TOTAL EAST WEST	TOTAL ALL DIREC.					
		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total		Trk	Bus	Left	Thru	Right	Total	Trk	Bus	Left	Thru			Right	Total	Trk	Bus	
Mid-Day PEAK	2025	Raw	338	134	127	599			112	141	45	298			897	59	257	237	553			180	258	55	493			1046	1943
	DHV	Factor	1.2525	1.2525	1.2525				1.2525	1.2525	1.2525					1.2525	1.2525	1.2525				1.2525	1.2525	1.2525					
	2025	No Build	423	168	159	750			140	177	56	373			1123	74	322	297	693			225	323	69	617			1310	2433
	Growth	Factor	0.0060	0.0060	0.0060				0.0060	0.0060	0.0060					0.0060	0.0060	0.0060				0.0060	0.0060	0.0060					
	2026	Adj +Growth+DHV	426	169	160	755			141	178	57	376			1131	74	324	299	697			227	325	69	621			1318	2449
	Opening Year	Round	430	170	160	760			140	180	60	380			1140	70	320	300	690			230	330	70	630			1320	2460
	2036	Adj +Growth+DHV	451	179	170	800			150	188	60	398			1198	79	343	316	738			240	344	73	657			1395	2593
	Design Year	Round	450	180	170	800			150	190	60	400			1200	80	340	320	740			240	340	70	650			1390	2590
	2025	Raw	385	174	216	775			112	228	61	401			1176	103	414	628	1145			273	375	95	743			1888	3064
DHV	Factor	1.2525	1.2525	1.2525				1.2525	1.2525	1.2525					1.2525	1.2525	1.2525				1.2525	1.2525	1.2525						
2025	No Build	482	218	271	971			140	286	76	502			1473	129	519	787	1435			342	470	119	931			2366	3839	
Growth	Factor	0.0060	0.0060	0.0060				0.0060	0.0060	0.0060					0.0060	0.0060	0.0060				0.0060	0.0060	0.0060						
2026	Adj +Growth+DHV	485	219	272	976			141	287	77	505			1481	130	522	791	1443			344	472	120	936			2379	3860	
Opening Year	Round	490	220	270	980			140	290	80	510			1490	130	520	790	1440			340	470	120	930			2370	3860	
2036	Adj +Growth+DHV	514	232	288	1034			150	304	81	535			1569	138	553	838	1529			364	501	127	992			2521	4090	
Design Year	Round	510	230	290	1030			150	300	80	530			1560	140	550	840	1530			360	500	130	990			2520	4080	

TMS Engineers, Inc.  
2112 Case Parkway S.  
Unit #7  
Twinsburg, Ohio 44087

# WORKSHEET FOR NO BUILD VEHICULAR TRAFFIC VOLUME CALCULATIONS

Cook Rd & Starbucks 013025

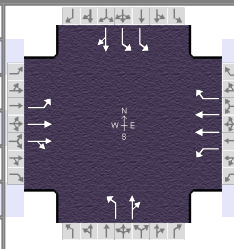
		FROM NORTH						Starbuck's FROM SOUTH						TOTAL NORTH SOUTH	Cook Rd. FROM EAST						Cook Rd. FROM WEST						TOTAL EAST WEST	TOTAL ALL DIREC.		
		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus				
Mid-Day PEAK	2025	Raw	0	0	0	0			36	0	29	65			65	8	308	0	316			0	208	42	250			566	631	
		DHV	Factor	1.0000	1.0000	1.0000				1.0000	1.0000	1.0000				1.0000	1.2286	1.2286				1.0000	1.2286	1.0000						
		2025	No Build	0	0	0	0			36	0	29	65			65	8	378	0	386			0	256	42	298			684	749
			Growth	Factor	0.0000	0.0000	0.0000				0.0000	0.0000	0.0000				0.0000	0.0060	0.0000				0.0000	0.0060	0.0000					
		2026	Adj +Growth+DHV	0	0	0	0			36	0	29	65			65	8	381	0	389			0	257	42	299			688	753
		Opening Year	Round	0	0	0	0			40	0	30	70			70	10	380	0	390			0	260	40	300			690	760
PM PEAK	2025	Raw	0	0	0	0			16	0	19	35			35	7	384	0	391			0	361	28	389			780	815	
			DHV	Factor	1.0000	1.0000	1.0000				1.0000	1.0000	1.0000				1.0000	1.2286	1.0000				1.0000	1.2286	1.0000					
		2025	No Build	0	0	0	0			16	0	19	35			35	7	472	0	479			0	444	28	472			951	986
			Growth	Factor	0.0000	0.0000	0.0000				0.0000	0.0000	0.0000				0.0000	0.0060	0.0000				0.0000	0.0060	0.0000					
	2026	Adj+Growth+DHV	0	0	0	0			16	0	19	35			35	7	475	0	482			0	446	28	474			956	991	
	Opening Year	Round	0	0	0	0			20	0	20	40			40	10	470	0	480			0	450	30	480			960	1000	
	2036	Adj+Growth+DHV	0	0	0	0			16	0	19	35			35	7	503	0	510			0	473	28	501			1011	1046	
	Design Year	Round	0	0	0	0			20	0	20	40			40	10	500	0	510			0	470	30	500			1010	1050	

# **Appendix I**

## **No-Build Capacity Analysis Worksheets - 2026**

## HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	Mid-Day Peak	PHF	0.94
Urban Street	Lorain Road	Analysis Year	2026	Analysis Period	1 > 7:00
Intersection	Lorain Road & Lear Nag...	File Name	1. Mid-Day 2026 Lorain Rd. & Cook Rd. NB.xus		
Project Description	No-Build				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	230	330	70	70	320	300	140	180	60	430	170	160

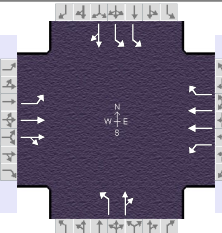
Signal Information				Signal Phases											
Cycle, s	110.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Fixed	Simult. Gap N/S	On												
		Green		6.3	5.8	40.3	9.4	2.8	18.4						
		Yellow		3.2	0.0	4.1	3.2	3.2	4.1						
		Red		2.8	0.0	1.1	2.0	2.0	1.3						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	18.1	51.3	12.3	45.5	14.6	23.8	22.6	31.8
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	11.3		4.8		9.5	17.2	16.2	23.7
Green Extension Time ( g <sub>e</sub> ), s	0.4	0.0	0.1	0.0	0.0	1.2	1.1	1.2
Phase Call Probability	1.00		0.90		0.99	1.00	1.00	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.00	0.00

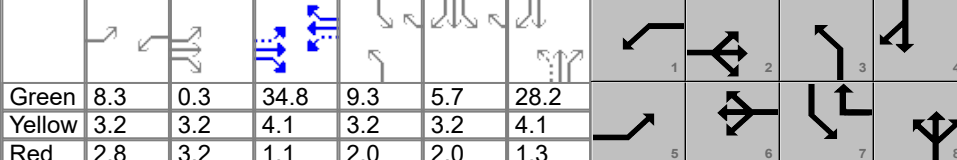
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	245	217	208	74	340	223	149	255		457	351	
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1739	1826	1715	1767	1766	1572	1781	1790		1716	1707	
Queue Service Time ( g <sub>s</sub> ), s	9.3	8.6	8.8	2.8	7.4	8.7	7.5	15.2		14.2	21.7	
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	9.3	8.6	8.8	2.8	7.4	8.7	7.5	15.2		14.2	21.7	
Green Ratio ( g/C )	0.49	0.42	0.42	0.42	0.37	0.52	0.25	0.17		0.16	0.24	
Capacity ( c ), veh/h	554	766	719	473	1295	825	243	300		542	410	
Volume-to-Capacity Ratio ( X )	0.442	0.284	0.289	0.158	0.263	0.271	0.612	0.851		0.844	0.857	
Back of Queue ( Q ), ft/ln ( 85 th percentile)	145	152	142	52	128	128	135	244		221	314	
Back of Queue ( Q ), veh/ln ( 85 th percentile)	5.6	5.8	5.7	2.0	5.0	5.0	5.3	9.6		8.6	12.3	
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.30	0.15	0.15	0.21	0.13	0.24	0.79	0.24		0.43	0.31	
Uniform Delay ( d <sub>1</sub> ), s/veh	17.4	21.1	21.1	19.2	24.4	14.5	34.8	44.5		45.0	40.0	
Incremental Delay ( d <sub>2</sub> ), s/veh	0.2	0.9	1.0	0.1	0.5	0.8	2.9	2.7		1.4	2.1	
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh	17.6	22.0	22.1	19.3	24.9	15.3	37.7	47.1		46.4	42.1	
Level of Service ( LOS )	B	C	C	B	C	B	D	D		D	D	
Approach Delay, s/veh / LOS	20.4		C	20.9		C	43.7		D	44.5		D
Intersection Delay, s/veh / LOS	32.0						C					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TMS Engineers, Inc.			Duration, h	0.250	
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other	
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.96	
Urban Street	Lorain Road	Analysis Year	2026	Analysis Period	1 > 7:00	
Intersection	Lorain Road & Lear Nag...	File Name	1. PM 2026 Lorain Rd. & Cook Rd. NB.xus			
Project Description	No-Build					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	340	470	120	130	520	790	140	290	80	490	220	270

Signal Information														
Cycle, s	120.0	Reference Phase	2	Green	8.3	0.3	34.8	9.3	5.7	28.2				
Offset, s	0	Reference Point	End	Yellow	3.2	3.2	4.1	3.2	3.2	4.1				
Uncoordinated	No	Simult. Gap E/W	On	Red	2.8	3.2	1.1	2.0	2.0	1.3				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	21.0	46.7	14.3	40.0	14.5	33.6	25.4	44.5
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	16.6		8.3		9.3	26.8	19.1	36.3
Green Extension Time ( g <sub>e</sub> ), s	0.0	0.0	0.1	0.0	0.0	1.4	1.1	1.5
Phase Call Probability	1.00		0.99		0.99	1.00	1.00	1.00
Max Out Probability	1.00		0.00		1.00	0.21	0.00	0.13

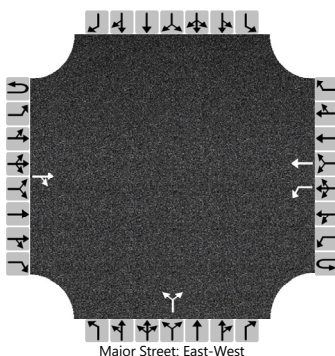
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	354	317	298	135	542	729	146	385		510	510	
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1781	1870	1739	1795	1795	1598	1795	1815		1743	1715	
Queue Service Time ( g <sub>s</sub> ), s	14.6	16.0	16.2	6.3	15.1	34.8	7.3	24.8		17.1	34.3	
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	14.6	16.0	16.2	6.3	15.1	34.8	7.3	24.8		17.1	34.3	
Green Ratio ( g/C )	0.43	0.35	0.35	0.36	0.29	0.46	0.31	0.23		0.17	0.33	
Capacity ( c ), veh/h	419	648	602	343	1041	732	220	426		586	559	
Volume-to-Capacity Ratio ( X )	0.845	0.490	0.494	0.395	0.520	0.996	0.664	0.905		0.871	0.914	
Back of Queue ( Q ), ft/ln ( 85 th percentile)	297	266	249	111	240	806	134	416		267	520	
Back of Queue ( Q ), veh/ln ( 85 th percentile)	11.7	10.5	10.0	4.4	9.5	32.0	5.3	16.5		10.6	20.6	
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.61	0.27	0.25	0.44	0.24	1.49	0.79	0.42		0.51	0.52	
Uniform Delay ( d <sub>1</sub> ), s/veh	29.0	30.9	30.9	27.3	35.6	32.4	34.0	44.6		48.6	38.8	
Incremental Delay ( d <sub>2</sub> ), s/veh	13.9	2.6	2.9	0.3	1.9	32.4	4.2	15.6		4.1	15.1	
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh	42.9	33.5	33.8	27.6	37.5	64.8	38.2	60.2		52.7	53.9	
Level of Service ( LOS )	D	C	C	C	D	E	D	E		D	D	
Approach Delay, s/veh / LOS	37.1		D	50.7		D	54.2		D	53.3		D
Intersection Delay, s/veh / LOS	48.5						D					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC			Intersection	Cook Road & Starbucks Driveway		
Agency/Co.	TMS Engineers, Inc.			Jurisdiction	North Ridgeville		
Date Performed	1/31/2025			East/West Street	Cook Road		
Analysis Year	2026			North/South Street	Starbucks Driveway		
Time Analyzed	Mid-Day Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	No-Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			270	40		10	340			40		30				
Percent Heavy Vehicles (%)						1				0		0				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.11					6.40		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.21					3.50		3.30			

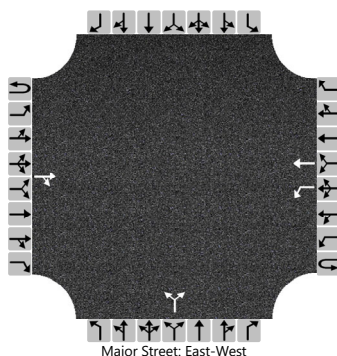
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						11						76				
Capacity, c (veh/h)						1228						497				
v/c Ratio						0.01						0.15				
95% Queue Length, Q <sub>95</sub> (veh)						0.0						0.5				
95% Queue Length, Q <sub>95</sub> (ft)						0.0						12.5				
Control Delay (s/veh)						8.0						13.5				
Level of Service (LOS)						A						B				
Approach Delay (s/veh)					0.2				13.5							
Approach LOS					A				B							

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC	Intersection	Cook Road & Starbucks Driveway				
Agency/Co.	TMS Engineers, Inc.	Jurisdiction	North Ridgeville				
Date Performed	1/31/2025	East/West Street	Cook Road				
Analysis Year	2026	North/South Street	Starbucks Driveway				
Time Analyzed	PM Peak	Peak Hour Factor	0.91				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	No-Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	1	1	0	0	1	0		0	0	0	
Configuration				TR		L	T				LR					
Volume (veh/h)			440	30		10	490			20		20				
Percent Heavy Vehicles (%)						2				0		0				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.12				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.22				3.50		3.30				

## Delay, Queue Length, and Level of Service

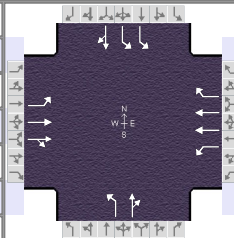
Flow Rate, v (veh/h)						11				44						
Capacity, c (veh/h)						1049				346						
v/c Ratio						0.01				0.13						
95% Queue Length, Q <sub>95</sub> (veh)						0.0				0.4						
95% Queue Length, Q <sub>95</sub> (ft)						0.0				10.0						
Control Delay (s/veh)						8.5				16.9						
Level of Service (LOS)						A				C						
Approach Delay (s/veh)					0.2				16.9							
Approach LOS					A				C							

## **Appendix J**

### **Build Capacity Analysis Worksheets - 2026**

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TMS Engineers, Inc.			Duration, h	0.250		
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other		
Jurisdiction	North Ridgeville	Time Period	Mid-Day Peak	PHF	0.94		
Urban Street	Lorain Road	Analysis Year	2026	Analysis Period	1 > 7:00		
Intersection	Lorain Road & Lear Nag...	File Name	1. Mid-Day 2026 Lorain Rd. & Cook Rd..xus				
Project Description	Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	230	330	88	90	320	300	157	199	82	430	192	160

Signal Information				Signal Phases																				
Cycle, s	110.0	Reference Phase	2																					
Offset, s	0	Reference Point	End	Green	6.6	5.9	37.0	9.8	2.4	21.3	Yellow	3.2	0.0	4.1	3.2	3.2	4.1	Red	2.8	0.0	1.1	2.0	2.0	1.3
Uncoordinated	No	Simult. Gap E/W	On																					
Force Mode	Fixed	Simult. Gap N/S	On																					

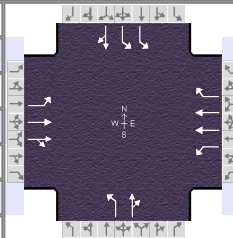
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	18.5	48.1	12.6	42.2	15.0	26.7	22.6	34.2
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	11.7		5.8		10.2	19.9	16.2	24.7
Green Extension Time ( g <sub>e</sub> ), s	0.4	0.0	0.1	0.0	0.0	1.3	1.1	1.3
Phase Call Probability	1.00		0.95		0.99	1.00	1.00	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	245	228	216	96	340	223	167	299		457	374	
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1739	1826	1694	1767	1766	1572	1781	1777		1716	1715	
Queue Service Time ( g <sub>s</sub> ), s	9.7	9.6	9.8	3.8	7.8	9.2	8.2	17.9		14.2	22.7	
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	9.7	9.6	9.8	3.8	7.8	9.2	8.2	17.9		14.2	22.7	
Green Ratio ( g/C )	0.46	0.39	0.39	0.40	0.34	0.49	0.28	0.19		0.16	0.26	
Capacity ( c ), veh/h	527	713	661	437	1190	778	262	344		542	450	
Volume-to-Capacity Ratio ( X )	0.464	0.320	0.327	0.219	0.286	0.287	0.636	0.870		0.844	0.833	
Back of Queue ( Q ), ft/ln ( 85 th percentile)	152	167	155	72	134	136	146	278		221	325	
Back of Queue ( Q ), veh/ln ( 85 th percentile)	5.9	6.4	6.2	2.8	5.2	5.3	5.8	10.9		8.6	12.7	
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.31	0.17	0.16	0.29	0.13	0.25	0.86	0.28		0.43	0.33	
Uniform Delay ( d <sub>1</sub> ), s/veh	19.2	23.4	23.4	21.3	26.8	16.4	32.8	43.0		45.0	38.3	
Incremental Delay ( d <sub>2</sub> ), s/veh	0.2	1.2	1.3	0.1	0.6	0.9	3.9	2.7		1.4	1.6	
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh	19.4	24.6	24.8	21.4	27.4	17.3	36.7	45.7		46.4	39.9	
Level of Service ( LOS )	B	C	C	C	C	B	D	D		D	D	
Approach Delay, s/veh / LOS	22.8		C	23.1		C	42.5		D	43.5		D
Intersection Delay, s/veh / LOS	32.8						C					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TMS Engineers, Inc.			Duration, h	0.250		
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other		
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.96		
Urban Street	Lorain Road	Analysis Year	2026	Analysis Period	1 > 7:00		
Intersection	Lorain Road & Lear Nag...	File Name	1. PM 2026 Lorain Rd. & Cook Rd..xus				
Project Description	Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	340	470	128	142	520	790	148	301	88	490	229	270

Signal Information				Phase Diagrams											
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Fixed	Simult. Gap N/S	On												
		Green		8.9	4.9	34.8	9.6	5.4	29.4						
		Yellow		3.2	0.0	4.1	3.2	3.2	4.1						
		Red		2.8	0.0	1.1	2.0	2.0	1.3						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	19.8	44.9	14.9	40.0	14.8	34.8	25.4	45.4
Change Period, ( $Y+R_c$ ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( $MAH$ ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( $g_s$ ), s	15.4		8.9		9.6	28.1	19.1	36.7
Green Extension Time ( $g_e$ ), s	0.0	0.0	0.1	0.0	0.0	1.3	1.1	1.5
Phase Call Probability	1.00		0.99		0.99	1.00	1.00	1.00
Max Out Probability	1.00		0.04		1.00	0.36	0.00	0.18

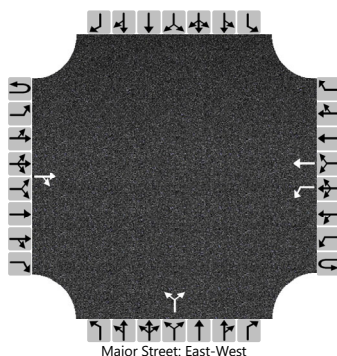
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( $v$ ), veh/h	354	322	301	148	542	729	154	405		510	520	
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1781	1870	1732	1795	1795	1598	1795	1811		1743	1718	
Queue Service Time ( $g_s$ ), s	13.4	16.7	16.9	6.9	15.1	34.8	7.6	26.1		17.1	34.7	
Cycle Queue Clearance Time ( $g_c$ ), s	13.4	16.7	16.9	6.9	15.1	34.8	7.6	26.1		17.1	34.7	
Green Ratio ( $g/C$ )	0.41	0.33	0.33	0.36	0.29	0.46	0.33	0.25		0.17	0.33	
Capacity ( $c$ ), veh/h	401	619	573	333	1041	732	228	444		586	573	
Volume-to-Capacity Ratio ( $X$ )	0.884	0.520	0.525	0.444	0.520	0.996	0.676	0.912		0.871	0.907	
Back of Queue ( $Q$ ), ft/ln ( 85 th percentile)	211	278	260	119	240	806	140	442		267	525	
Back of Queue ( $Q$ ), veh/ln ( 85 th percentile)	8.3	10.9	10.4	4.7	9.5	32.0	5.5	17.5		10.6	20.8	
Queue Storage Ratio ( $RQ$ ) ( 85 th percentile)	0.43	0.28	0.26	0.48	0.24	1.49	0.82	0.44		0.51	0.53	
Uniform Delay ( $d_1$ ), s/veh	32.5	32.5	32.5	27.4	35.6	32.4	33.2	44.0		48.6	38.2	
Incremental Delay ( $d_2$ ), s/veh	19.6	3.1	3.4	0.3	1.9	32.4	5.0	17.6		4.1	14.8	
Initial Queue Delay ( $d_3$ ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( $d$ ), s/veh	52.1	35.6	35.9	27.8	37.5	64.8	38.2	61.6		52.7	53.0	
Level of Service (LOS)	D	D	D	C	D	E	D	E		D	D	
Approach Delay, s/veh / LOS	41.7		D	50.5		D	55.2		E	52.9		D
Intersection Delay, s/veh / LOS	49.6						D					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC			Intersection	Cook Road & Starbucks Driveway		
Agency/Co.	TMS Engineers, Inc.			Jurisdiction	North Ridgeville		
Date Performed	1/31/2025			East/West Street	Cook Road		
Analysis Year	2026			North/South Street	Starbucks Driveway		
Time Analyzed	Mid-Day Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	1	1	0	0	1	0		0	0	0	
Configuration				TR		L	T				LR					
Volume (veh/h)			270	100		21	340			98		38				
Percent Heavy Vehicles (%)						1				0		0				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.11				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.50		3.30				

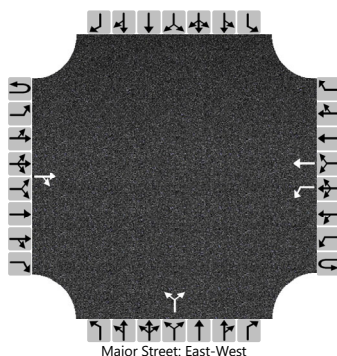
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						23						148				
Capacity, c (veh/h)						1162						424				
v/c Ratio						0.02						0.35				
95% Queue Length, Q <sub>95</sub> (veh)						0.1						1.5				
95% Queue Length, Q <sub>95</sub> (ft)						2.5						37.5				
Control Delay (s/veh)						8.2						18.0				
Level of Service (LOS)						A						C				
Approach Delay (s/veh)					0.5				18.0							
Approach LOS					A				C							

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC			Intersection	Cook Road & Starbucks Driveway		
Agency/Co.	TMS Engineers, Inc.			Jurisdiction	North Ridgeville		
Date Performed	1/31/2025			East/West Street	Cook Road		
Analysis Year	2026			North/South Street	Starbucks Driveway		
Time Analyzed	PM Peak			Peak Hour Factor	0.91		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			422	77		33	471			66		42				
Percent Heavy Vehicles (%)						2				0		0				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.12					6.40		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.22					3.50		3.30			

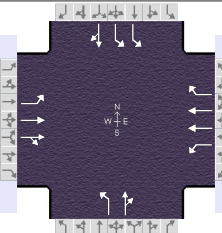
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						36						119				
Capacity, c (veh/h)						1021						299				
v/c Ratio						0.04						0.40				
95% Queue Length, Q <sub>95</sub> (veh)						0.1						1.8				
95% Queue Length, Q <sub>95</sub> (ft)						2.5						45.0				
Control Delay (s/veh)						8.7						24.7				
Level of Service (LOS)						A						C				
Approach Delay (s/veh)					0.6				24.7							
Approach LOS					A				C							

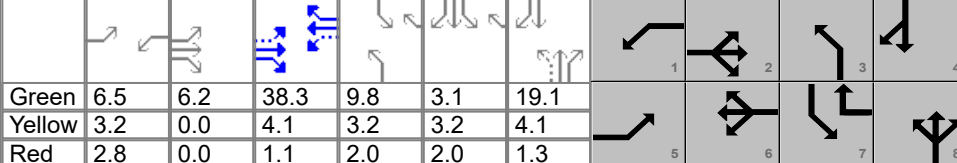
## **Appendix K**

### **No-Build Capacity Analysis Worksheets - 2036**

## HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TMS Engineers, Inc.			Duration, h	0.250	
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other	
Jurisdiction	North Ridgeville	Time Period	Mid-Day Peak	PHF	0.94	
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00	
Intersection	Lorain Road & Lear Nag...	File Name	1. Mid-Day 2036 Lorain Rd. & Cook Rd. NB.xus			
Project Description	No-Build					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	240	340	70	80	340	320	150	190	60	450	180	170

Signal Information																								
Cycle, s	110.0	Reference Phase	2	Green	6.5	6.2	38.3	9.8	3.1	19.1	Yellow	3.2	0.0	4.1	3.2	3.2	4.1	Red	2.8	0.0	1.1	2.0	2.0	1.3
Offset, s	0	Reference Point	End	Uncoordinated	No	Simult. Gap E/W	On	Force Mode	Fixed	Simult. Gap N/S	On													

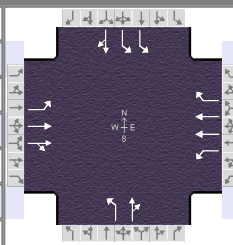
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	18.7	49.7	12.5	43.5	15.0	24.5	23.3	32.8
Change Period, ( $Y+R_c$ ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( $MAH$ ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( $g_s$ ), s	11.9		5.3		10.0	17.8	16.9	25.1
Green Extension Time ( $g_e$ ), s	0.4	0.0	0.1	0.0	0.0	1.3	1.2	1.3
Phase Call Probability	1.00		0.93		0.99	1.00	1.00	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( $v$ ), veh/h	255	223	213	85	362	245	160	266		479	372	
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1739	1826	1718	1767	1766	1572	1781	1793		1716	1706	
Queue Service Time ( $g_s$ ), s	9.9	9.1	9.3	3.3	8.2	9.9	8.0	15.8		14.9	23.1	
Cycle Queue Clearance Time ( $g_c$ ), s	9.9	9.1	9.3	3.3	8.2	9.9	8.0	15.8		14.9	23.1	
Green Ratio ( $g/C$ )	0.48	0.40	0.40	0.41	0.35	0.51	0.26	0.17		0.16	0.25	
Capacity ( $c$ ), veh/h	533	739	696	455	1230	806	245	311		564	425	
Volume-to-Capacity Ratio ( $X$ )	0.479	0.301	0.307	0.187	0.294	0.304	0.650	0.854		0.849	0.877	
Back of Queue ( $Q$ ), ft/ln ( 85 th percentile)	154	159	149	62	139	144	146	252		230	332	
Back of Queue ( $Q$ ), veh/ln ( 85 th percentile)	5.9	6.1	5.9	2.4	5.4	5.6	5.7	9.9		9.0	13.0	
Queue Storage Ratio ( $RQ$ ) ( 85 th percentile)	0.31	0.16	0.15	0.25	0.14	0.27	0.86	0.25		0.44	0.33	
Uniform Delay ( $d_1$ ), s/veh	18.2	22.2	22.2	20.4	26.0	15.5	34.3	44.1		44.6	39.7	
Incremental Delay ( $d_2$ ), s/veh	0.2	1.0	1.1	0.1	0.6	1.0	4.7	2.6		1.4	2.3	
Initial Queue Delay ( $d_3$ ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( $d$ ), s/veh	18.5	23.2	23.4	20.5	26.6	16.5	39.1	46.7		46.0	42.0	
Level of Service (LOS)	B	C	C	C	C	B	D	D		D	D	
Approach Delay, s/veh / LOS	21.5		C	22.3		C	43.8		D	44.3		D
Intersection Delay, s/veh / LOS	32.6						C					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TMS Engineers, Inc.			Duration, h	0.250		
Analyst	KMC	Analysis Date	10/20/2020	Area Type	Other		
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.96		
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00		
Intersection	Lorain Road & Lear Nag...	File Name	1. PM 2036 Lorain Rd. & Cook Rd. NB.xus				
Project Description	No-Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	360	500	130	140	550	840	150	300	80	510	230	290

Signal Information				Signal Timing (s)											
Cycle, s	120.0	Reference Phase	2	Green		Yellow		Red		Green		Yellow		Red	
Offset, s	0	Reference Point	End	8.8	4.7	34.8	9.7	6.0	29.0	29.0	4.1	4.1	1.3	1.3	1.3
Uncoordinated	No	Simult. Gap E/W	On	3.2	0.0	4.1	3.2	3.2	4.1	4.1	3.2	3.2	4.1	4.1	3.2
Force Mode	Fixed	Simult. Gap N/S	On	2.8	0.0	1.1	2.0	2.0	1.3	1.3	2.0	2.0	1.3	1.3	2.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	19.5	44.7	14.8	40.0	14.9	34.4	26.1	45.6
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	15.1		8.8		9.7	27.4	19.8	38.9
Green Extension Time ( g <sub>e</sub> ), s	0.0	0.0	0.1	0.0	0.0	1.4	1.1	1.3
Phase Call Probability	1.00		0.99		0.99	1.00	1.00	1.00
Max Out Probability	1.00		0.05		1.00	0.36	0.01	0.41

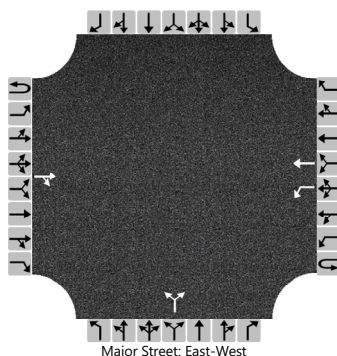
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	375	339	317	146	573	781	156	396		531	542	
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1781	1870	1737	1795	1795	1598	1795	1816		1743	1713	
Queue Service Time ( g <sub>s</sub> ), s	13.1	17.8	18.0	6.8	16.2	34.8	7.7	25.4		17.8	36.9	
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	13.1	17.8	18.0	6.8	16.2	34.8	7.7	25.4		17.8	36.9	
Green Ratio ( g/C )	0.40	0.33	0.33	0.36	0.29	0.46	0.32	0.24		0.17	0.34	
Capacity ( c ), veh/h	384	615	571	319	1041	742	215	439		607	574	
Volume-to-Capacity Ratio ( X )	0.975	0.551	0.555	0.457	0.550	1.054	0.727	0.901		0.875	0.944	
Back of Queue ( Q ), ft/ln ( 85 th percentile)	309	295	276	118	255	939	148	428		278	576	
Back of Queue ( Q ), veh/ln ( 85 th percentile)	12.2	11.6	11.1	4.7	10.1	37.3	5.9	17.0		11.0	22.9	
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.63	0.30	0.28	0.47	0.26	1.74	0.87	0.43		0.53	0.58	
Uniform Delay ( d <sub>1</sub> ), s/veh	35.2	33.0	33.0	27.7	36.0	32.2	33.6	44.1		48.3	38.8	
Incremental Delay ( d <sub>2</sub> ), s/veh	39.1	3.5	3.9	0.4	2.1	48.1	8.4	16.3		4.8	20.8	
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh	74.3	36.5	36.9	28.1	38.1	80.2	42.0	60.4		53.1	59.6	
Level of Service ( LOS )	E	D	D	C	D	F	D	E		D	E	
Approach Delay, s/veh / LOS	50.4		D	59.0		E	55.2		E	56.4		E
Intersection Delay, s/veh / LOS	55.7						E					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC			Intersection	Cook Road & Starbucks Driveway		
Agency/Co.	TMS Engineers, Inc.			Jurisdiction	North Ridgeville		
Date Performed	1/31/2025			East/West Street	Cook Road		
Analysis Year	2036			North/South Street	Starbucks Driveway		
Time Analyzed	Mid-Day Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	No-Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			290	40		10	360			40		30				
Percent Heavy Vehicles (%)						1				0		0				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.11					6.40		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.21					3.50		3.30			

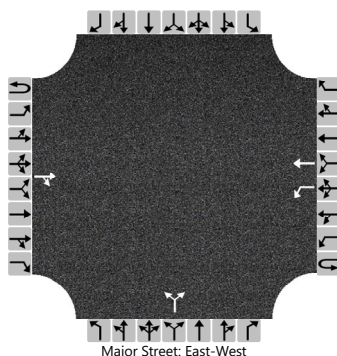
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						11						76				
Capacity, c (veh/h)						1206						473				
v/c Ratio						0.01						0.16				
95% Queue Length, Q <sub>95</sub> (veh)						0.0						0.6				
95% Queue Length, Q <sub>95</sub> (ft)						0.0						15.0				
Control Delay (s/veh)						8.0						14.1				
Level of Service (LOS)						A						B				
Approach Delay (s/veh)					0.2				14.1							
Approach LOS					A				B							

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC			Intersection	Cook Road & Starbucks Driveway		
Agency/Co.	TMS Engineers, Inc.			Jurisdiction	North Ridgeville		
Date Performed	1/31/2025			East/West Street	Cook Road		
Analysis Year	2036			North/South Street	Starbucks Driveway		
Time Analyzed	PM Peak			Peak Hour Factor	0.91		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	No-Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			470	30		10	510			20		20				
Percent Heavy Vehicles (%)						2				0		0				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.12					6.40		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.22					3.50		3.30			

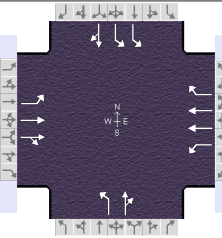
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						11						44				
Capacity, c (veh/h)						1020						324				
v/c Ratio						0.01						0.14				
95% Queue Length, Q <sub>95</sub> (veh)						0.0						0.5				
95% Queue Length, Q <sub>95</sub> (ft)						0.0						12.5				
Control Delay (s/veh)						8.6						17.8				
Level of Service (LOS)						A						C				
Approach Delay (s/veh)					0.2				17.8							
Approach LOS					A				C							

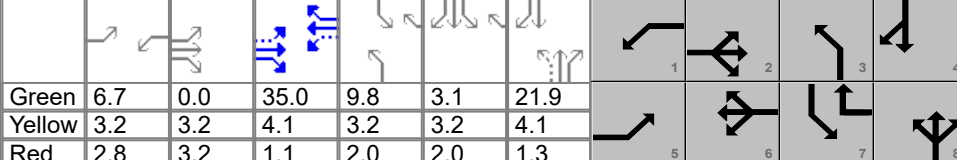
## **Appendix L**

### **Build Capacity Analysis Worksheets - 2036**

## HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TMS Engineers, Inc.			Duration, h	0.250	
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other	
Jurisdiction	North Ridgeville	Time Period	Mid-Day Peak	PHF	0.94	
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00	
Intersection	Lorain Road & Lear Nag...	File Name	1. Mid-Day 2036 Lorain Rd. & Cook Rd..xus			
Project Description	Build					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	240	340	88	100	340	320	167	209	82	450	202	170

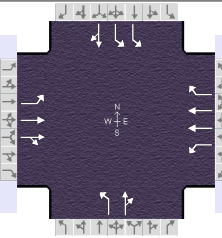
Signal Information														
Cycle, s	110.0	Reference Phase	2	Green	6.7	0.0	35.0	9.8	3.1	21.9				
Offset, s	0	Reference Point	End	Yellow	3.2	3.2	4.1	3.2	3.2	4.1				
Uncoordinated	No	Simult. Gap E/W	On	Red	2.8	3.2	1.1	2.0	2.0	1.3				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	19.2	46.7	12.7	40.2	15.0	27.3	23.3	35.6
Change Period, ( $Y+R_c$ ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( $MAH$ ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( $g_s$ ), s	12.4		6.4		10.7	20.5	16.9	25.9
Green Extension Time ( $g_e$ ), s	0.4	0.0	0.2	0.0	0.0	1.4	1.2	1.4
Phase Call Probability	1.00		0.96		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.00	0.00

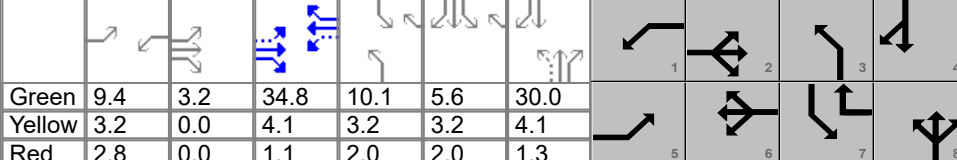
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( $v$ ), veh/h	255	234	222	106	362	245	178	310		479	396	
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1739	1826	1697	1767	1766	1572	1781	1780		1716	1715	
Queue Service Time ( $g_s$ ), s	10.4	10.1	10.3	4.4	8.6	10.5	8.7	18.5		14.9	23.9	
Cycle Queue Clearance Time ( $g_c$ ), s	10.4	10.1	10.3	4.4	8.6	10.5	8.7	18.5		14.9	23.9	
Green Ratio ( $g/C$ )	0.45	0.38	0.38	0.38	0.32	0.48	0.29	0.20		0.16	0.27	
Capacity ( $c$ ), veh/h	507	688	639	420	1125	759	263	355		564	471	
Volume-to-Capacity Ratio ( $X$ )	0.504	0.340	0.347	0.254	0.322	0.322	0.677	0.872		0.849	0.840	
Back of Queue ( $Q$ ), ft/ln ( 85 th percentile)	162	175	162	82	145	153	157	286		230	342	
Back of Queue ( $Q$ ), veh/ln ( 85 th percentile)	6.2	6.7	6.5	3.2	5.7	6.0	6.2	11.2		9.0	13.4	
Queue Storage Ratio ( $RQ$ ) ( 85 th percentile)	0.33	0.18	0.17	0.33	0.15	0.28	0.92	0.29		0.44	0.34	
Uniform Delay ( $d_1$ ), s/veh	20.0	24.5	24.6	22.7	28.5	17.4	32.7	42.7		44.6	37.6	
Incremental Delay ( $d_2$ ), s/veh	0.3	1.3	1.5	0.1	0.8	1.1	5.6	2.6		1.4	2.0	
Initial Queue Delay ( $d_3$ ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( $d$ ), s/veh	20.3	25.8	26.1	22.8	29.2	18.6	38.2	45.3		46.0	39.6	
Level of Service (LOS)	C	C	C	C	C	B	D	D		D	D	
Approach Delay, s/veh / LOS	23.9		C	24.6		C	42.7		D	43.1		D
Intersection Delay, s/veh / LOS	33.4						C					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TMS Engineers, Inc.			Duration, h	0.250	
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other	
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.96	
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00	
Intersection	Lorain Road & Lear Nag...	File Name	1. PM 2036 Lorain Rd. & Cook Rd..xus			
Project Description	Build					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	360	500	138	152	550	840	158	311	88	510	239	290

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	9.4	3.2	34.8	10.1	5.6	30.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.2	0.0	4.1	3.2	3.2	4.1			
				Red	2.8	0.0	1.1	2.0	2.0	1.3			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	18.5	43.2	15.4	40.0	15.3	35.4	26.1	46.2
Change Period, ( $Y+R_c$ ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( $MAH$ ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( $g_s$ ), s	14.1		9.3		10.1	28.8	19.8	39.5
Green Extension Time ( $g_e$ ), s	0.0	0.0	0.1	0.0	0.0	1.2	1.1	1.2
Phase Call Probability	1.00		0.99		1.00	1.00	1.00	1.00
Max Out Probability	1.00		0.30		1.00	0.59	0.01	0.56

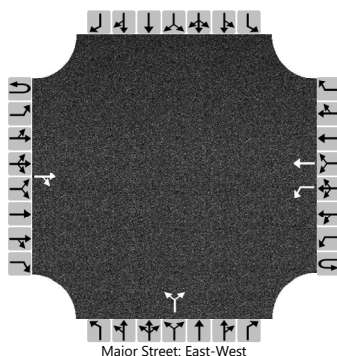
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( $v$ ), veh/h	375	344	321	158	573	781	165	416		531	551	
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1781	1870	1731	1795	1795	1598	1795	1813		1743	1716	
Queue Service Time ( $g_s$ ), s	12.1	18.5	18.7	7.3	16.2	34.8	8.1	26.8		17.8	37.5	
Cycle Queue Clearance Time ( $g_c$ ), s	12.1	18.5	18.7	7.3	16.2	34.8	8.1	26.8		17.8	37.5	
Green Ratio ( $g/C$ )	0.39	0.32	0.32	0.37	0.29	0.46	0.33	0.25		0.17	0.34	
Capacity ( $c$ ), veh/h	370	592	547	312	1041	742	220	453		607	584	
Volume-to-Capacity Ratio ( $X$ )	1.012	0.581	0.586	0.507	0.550	1.054	0.748	0.918		0.875	0.944	
Back of Queue ( $Q$ ), ft/ln ( 85 th percentile)	349	307	286	126	255	939	156	458		278	587	
Back of Queue ( $Q$ ), veh/ln ( 85 th percentile)	13.8	12.1	11.5	5.0	10.1	37.3	6.2	18.2		11.0	23.3	
Queue Storage Ratio ( $RQ$ ) ( 85 th percentile)	0.71	0.31	0.29	0.50	0.26	1.74	0.92	0.46		0.53	0.59	
Uniform Delay ( $d_1$ ), s/veh	36.9	34.4	34.4	27.9	36.0	32.2	33.0	43.8		48.3	38.5	
Incremental Delay ( $d_2$ ), s/veh	49.9	4.1	4.5	0.5	2.1	48.1	10.4	19.5		4.8	21.4	
Initial Queue Delay ( $d_3$ ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( $d$ ), s/veh	86.8	38.5	39.0	28.3	38.1	80.2	43.5	63.3		53.1	59.9	
Level of Service (LOS)	F	D	D	C	D	F	D	E		D	E	
Approach Delay, s/veh / LOS	56.1		E	58.8		E	57.7		E	56.5		E
Intersection Delay, s/veh / LOS	57.4						E					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC			Intersection	Cook Road & Starbucks Driveway		
Agency/Co.	TMS Engineers, Inc.			Jurisdiction	North Ridgeville		
Date Performed	1/31/2025			East/West Street	Cook Road		
Analysis Year	2036			North/South Street	Starbucks Driveway		
Time Analyzed	Mid-Day Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			290	100		21	360			98		38				
Percent Heavy Vehicles (%)						1				0		0				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.11					6.40		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.21					3.50		3.30			

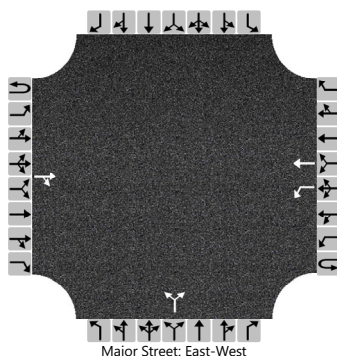
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						23						148				
Capacity, c (veh/h)						1141						402				
v/c Ratio						0.02						0.37				
95% Queue Length, Q <sub>95</sub> (veh)						0.1						1.7				
95% Queue Length, Q <sub>95</sub> (ft)						2.5						42.5				
Control Delay (s/veh)						8.2						19.1				
Level of Service (LOS)						A						C				
Approach Delay (s/veh)					0.5				19.1							
Approach LOS					A				C							

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KMC			Intersection	Cook Road & Starbucks Driveway		
Agency/Co.	TMS Engineers, Inc.			Jurisdiction	North Ridgeville		
Date Performed	1/31/2025			East/West Street	Cook Road		
Analysis Year	2036			North/South Street	Starbucks Driveway		
Time Analyzed	PM Peak			Peak Hour Factor	0.91		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Build						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			452	77		33	491			66		42				
Percent Heavy Vehicles (%)						2				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.12					6.40		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.22					3.50		3.30			

## Delay, Queue Length, and Level of Service

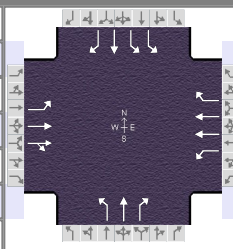
Flow Rate, v (veh/h)						36						119				
Capacity, c (veh/h)						993						279				
v/c Ratio						0.04						0.43				
95% Queue Length, Q <sub>95</sub> (veh)						0.1						2.0				
95% Queue Length, Q <sub>95</sub> (ft)						2.5						50.0				
Control Delay (s/veh)						8.8						27.1				
Level of Service (LOS)						A						D				
Approach Delay (s/veh)					0.6				27.1							
Approach LOS					A				D							

## **Appendix M**

### **Improved Capacity Analysis Worksheets - 2036**

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TMS Engineers, Inc.			Duration, h	0.250		
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other		
Jurisdiction	North Ridgeville	Time Period	Mid-Day Peak	PHF	0.94		
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00		
Intersection	Lorain Road & Lear Nag...	File Name	1. Improved Mid-Day 2036 Lorain Rd. & Cook Rd....				
Project Description	No-Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	240	340	70	80	340	320	150	190	60	450	180	170

Signal Information				Signal Phases											
Cycle, s	110.0	Reference Phase	2	Green		Yellow		Red		Phase 2		Phase 3		Phase 4	
Offset, s	0	Reference Point	End	6.5	5.6	43.3	9.8	3.1	14.8	Phase 5		Phase 6		Phase 7	
Uncoordinated	No	Simult. Gap E/W	On	3.2	0.0	4.1	3.2	3.2	4.1	Phase 8		Phase 9		Phase 10	
Force Mode	Fixed	Simult. Gap N/S	On	2.8	0.0	1.1	2.0	2.0	1.3	Phase 11		Phase 12		Phase 13	

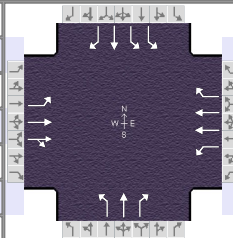
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	3.0	2.0	3.0
Phase Duration, s	18.1	54.1	12.5	48.5	15.0	20.2	23.3	28.4
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	11.3		5.0		10.4	13.5	16.9	12.0
Green Extension Time ( g <sub>e</sub> ), s	0.5	0.0	0.1	0.0	0.0	1.2	1.2	1.2
Phase Call Probability	1.00		0.93		0.99	1.00	1.00	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	255	223	213	85	362	245	160	202	64	479	191	181
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1739	1826	1718	1767	1766	1572	1781	1870	1610	1716	1856	1610
Queue Service Time ( g <sub>s</sub> ), s	9.3	8.5	8.7	3.0	7.6	9.0	8.4	11.5	3.7	14.9	10.0	9.5
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	9.3	8.5	8.7	3.0	7.6	9.0	8.4	11.5	3.7	14.9	10.0	9.5
Green Ratio ( g/C )	0.51	0.44	0.44	0.45	0.39	0.56	0.22	0.13	0.19	0.16	0.21	0.32
Capacity ( c ), veh/h	573	811	763	498	1389	877	344	251	311	564	389	509
Volume-to-Capacity Ratio ( X )	0.445	0.275	0.280	0.171	0.260	0.279	0.464	0.805	0.205	0.849	0.493	0.356
Back of Queue ( Q ), ft/ln ( 85 th percentile)	144	148	138	56	130	130	143	200	65	230	173	141
Back of Queue ( Q ), veh/ln ( 85 th percentile)	5.5	5.7	5.5	2.2	5.1	5.1	5.6	7.9	2.6	9.0	6.7	5.6
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.29	0.15	0.14	0.23	0.13	0.24	0.84	0.20	0.00	0.44	0.17	0.00
Uniform Delay ( d <sub>1</sub> ), s/veh	15.9	19.3	19.4	17.5	22.6	12.8	36.5	46.2	37.3	44.6	38.3	29.0
Incremental Delay ( d <sub>2</sub> ), s/veh	0.2	0.8	0.9	0.1	0.5	0.8	0.4	2.3	0.1	1.4	0.4	0.2
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay ( d ), s/veh	16.1	20.2	20.3	17.5	23.0	13.5	36.9	48.5	37.4	46.0	38.7	29.2
Level of Service ( LOS )	B	C	C	B	C	B	D	D	D	D	D	C
Approach Delay, s/veh / LOS	18.7		B	19.0		B	42.5		D	40.8		D
Intersection Delay, s/veh / LOS	29.7						C					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TMS Engineers, Inc.			Duration, h	0.250		
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other		
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.96		
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00		
Intersection	Lorain Road & Lear Nag...	File Name	1. Improved PM 2036 Lorain Rd. & Cook Rd. NB....				
Project Description	No-Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	360	500	130	140	550	840	150	300	80	510	230	290

Signal Information				Signal Phases								
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	8.2	3.2	43.8	10.5	4.9	22.4		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.2	0.0	4.1	3.2	3.2	4.1		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.8	0.0	1.1	2.0	2.0	1.3		

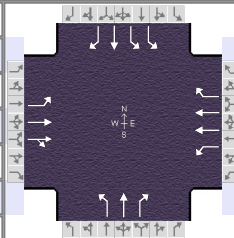
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	3.0	2.0	3.0
Phase Duration, s	17.4	52.2	14.2	49.0	15.7	27.8	25.8	37.9
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	13.0		8.0		10.3	21.4	19.9	19.7
Green Extension Time ( g <sub>e</sub> ), s	0.0	0.0	0.2	0.0	0.3	1.1	0.7	1.8
Phase Call Probability	1.00		0.99		0.99	1.00	1.00	1.00
Max Out Probability	1.00		0.00		0.00	0.64	0.31	0.01

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	375	339	317	146	573	781	156	313	83	531	240	302
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1781	1870	1737	1795	1795	1598	1795	1885	1610	1743	1885	1610
Queue Service Time ( g <sub>s</sub> ), s	11.0	16.2	16.3	6.0	14.5	43.8	8.3	19.4	4.9	17.9	12.7	17.7
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	11.0	16.2	16.3	6.0	14.5	43.8	8.3	19.4	4.9	17.9	12.7	17.7
Green Ratio ( g/C )	0.46	0.39	0.39	0.43	0.36	0.54	0.27	0.19	0.26	0.17	0.27	0.36
Capacity ( c ), veh/h	428	732	680	370	1310	857	387	353	411	598	511	584
Volume-to-Capacity Ratio ( X )	0.876	0.463	0.466	0.394	0.437	0.912	0.403	0.886	0.203	0.889	0.469	0.518
Back of Queue ( Q ), ft/ln ( 85 th percentile)	254	264	247	105	226	693	141	354	84	292	211	237
Back of Queue ( Q ), veh/ln ( 85 th percentile)	10.0	10.4	9.9	4.2	9.0	27.5	5.6	14.1	3.4	11.6	8.4	9.5
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.52	0.26	0.25	0.42	0.23	1.28	0.83	0.35	0.00	0.56	0.21	0.00
Uniform Delay ( d <sub>1</sub> ), s/veh	30.5	27.1	27.2	22.1	28.8	25.2	34.7	47.5	35.1	48.6	36.5	30.0
Incremental Delay ( d <sub>2</sub> ), s/veh	17.4	2.1	2.3	0.3	1.1	15.6	0.3	17.2	0.1	10.3	0.2	0.3
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay ( d ), s/veh	48.0	29.2	29.5	22.4	29.9	40.8	34.9	64.7	35.2	58.9	36.8	30.3
Level of Service ( LOS )	D	C	C	C	C	D	C	E	D	E	D	C
Approach Delay, s/veh / LOS	36.1		D	34.8		C	51.9		D	45.9		D
Intersection Delay, s/veh / LOS	40.3						D					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TMS Engineers, Inc.			Duration, h	0.250		
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other		
Jurisdiction	North Ridgeville	Time Period	Mid-Day Peak	PHF	0.94		
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00		
Intersection	Lorain Road & Lear Nag...	File Name	1. Improved Mid-Day 2036 Lorain Rd. & Cook Rd....				
Project Description	Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	240	340	88	100	340	320	167	209	82	450	202	170

Signal Information				Signal Phases											
Cycle, s	110.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Fixed	Simult. Gap N/S	On												
		Green		6.7	5.6	41.8	9.8	3.1	16.0						
		Yellow		3.2	0.0	4.1	3.2	3.2	4.1						
		Red		2.8	0.0	1.1	2.0	2.0	1.3						

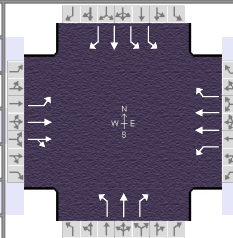
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	3.0	2.0	3.0
Phase Duration, s	18.3	52.6	12.7	47.0	15.0	21.4	23.3	29.7
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	11.5		5.9		11.3	14.7	16.9	13.2
Green Extension Time ( g <sub>e</sub> ), s	0.4	0.0	0.2	0.0	0.0	1.4	1.2	1.4
Phase Call Probability	1.00		0.96		1.00	1.00	1.00	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	255	234	222	106	362	245	178	222	87	479	215	181
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1739	1826	1697	1767	1766	1572	1781	1870	1610	1716	1856	1610
Queue Service Time ( g <sub>s</sub> ), s	9.5	9.2	9.4	3.9	7.8	9.2	9.3	12.7	5.0	14.9	11.2	9.3
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	9.5	9.2	9.4	3.9	7.8	9.2	9.3	12.7	5.0	14.9	11.2	9.3
Green Ratio ( g/C )	0.50	0.43	0.43	0.44	0.38	0.54	0.23	0.15	0.21	0.16	0.22	0.33
Capacity ( c ), veh/h	562	786	731	477	1341	855	342	273	333	564	410	530
Volume-to-Capacity Ratio ( X )	0.455	0.297	0.303	0.223	0.270	0.286	0.520	0.815	0.262	0.849	0.524	0.341
Back of Queue ( Q ), ft/ln ( 85 th percentile)	147	159	148	73	132	134	156	216	85	230	190	138
Back of Queue ( Q ), veh/ln ( 85 th percentile)	5.7	6.1	5.9	2.9	5.2	5.2	6.1	8.5	3.4	9.0	7.4	5.5
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.30	0.16	0.15	0.29	0.13	0.25	0.92	0.22	0.00	0.44	0.19	0.00
Uniform Delay ( d <sub>1</sub> ), s/veh	16.7	20.5	20.5	18.5	23.6	13.5	35.9	45.5	36.6	44.6	37.7	27.9
Incremental Delay ( d <sub>2</sub> ), s/veh	0.2	1.0	1.1	0.1	0.5	0.8	0.7	2.3	0.2	1.4	0.4	0.1
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay ( d ), s/veh	16.9	21.4	21.6	18.6	24.1	14.4	36.6	47.8	36.7	46.0	38.1	28.0
Level of Service ( LOS )	B	C	C	B	C	B	D	D	D	D	D	C
Approach Delay, s/veh / LOS	19.8		B	19.9		B	41.7		D	40.4		D
Intersection Delay, s/veh / LOS	30.1						C					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TMS Engineers, Inc.			Duration, h	0.250		
Analyst	KMC	Analysis Date	Feb 7, 2025	Area Type	Other		
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.96		
Urban Street	Lorain Road	Analysis Year	2036	Analysis Period	1 > 7:00		
Intersection	Lorain Road & Lear Nag...	File Name	1. Improved PM 2036 Lorain Rd. & Cook Rd..xus				
Project Description	Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	360	500	138	152	550	840	158	311	88	510	239	290

Signal Information				Signal Diagrams								
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
Green	8.7	2.0	43.8	10.9	4.5	23.1	2		3		4	
Yellow	3.2	0.0	4.1	3.2	3.2	4.1	5		6		7	
Red	2.8	0.0	1.1	2.0	2.0	1.3	8					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	3.0	2.0	3.0
Phase Duration, s	16.7	51.0	14.7	49.0	16.1	28.5	25.8	38.1
Change Period, ( Y+R <sub>c</sub> ), s	6.4	5.2	6.0	5.2	5.2	5.4	5.2	5.4
Max Allow Headway ( MAH ), s	3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time ( g <sub>s</sub> ), s	12.3		8.5		10.7	22.1	19.9	19.8
Green Extension Time ( g <sub>e</sub> ), s	0.0	0.0	0.3	0.0	0.3	1.0	0.7	1.9
Phase Call Probability	1.00		0.99		1.00	1.00	1.00	1.00
Max Out Probability	1.00		0.00		0.00	0.83	0.31	0.01

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h	375	344	321	158	573	781	165	324	92	531	249	302
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1781	1870	1731	1795	1795	1598	1795	1885	1610	1743	1885	1610
Queue Service Time ( g <sub>s</sub> ), s	10.3	16.7	16.9	6.5	14.5	43.8	8.7	20.1	5.3	17.9	13.3	17.8
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	10.3	16.7	16.9	6.5	14.5	43.8	8.7	20.1	5.3	17.9	13.3	17.8
Green Ratio ( g/C )	0.45	0.38	0.38	0.44	0.36	0.54	0.28	0.19	0.27	0.17	0.27	0.36
Capacity ( c ), veh/h	419	714	661	365	1310	857	389	363	427	598	514	578
Volume-to-Capacity Ratio ( X )	0.896	0.482	0.485	0.434	0.437	0.912	0.423	0.894	0.215	0.889	0.484	0.522
Back of Queue ( Q ), ft/ln ( 85 th percentile)	281	273	254	112	226	693	146	370	90	292	218	238
Back of Queue ( Q ), veh/ln ( 85 th percentile)	11.1	10.7	10.2	4.5	9.0	27.5	5.8	14.7	3.6	11.6	8.7	9.5
Queue Storage Ratio ( RQ ) ( 85 th percentile)	0.57	0.27	0.26	0.45	0.23	1.28	0.86	0.37	0.00	0.56	0.22	0.00
Uniform Delay ( d <sub>1</sub> ), s/veh	31.9	28.1	28.2	22.3	28.8	25.2	34.1	47.3	34.4	48.6	36.6	30.3
Incremental Delay ( d <sub>2</sub> ), s/veh	20.7	2.3	2.5	0.3	1.1	15.6	0.3	18.8	0.1	10.3	0.3	0.3
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay ( d ), s/veh	52.6	30.4	30.7	22.6	29.9	40.8	34.4	66.1	34.4	58.9	36.8	30.6
Level of Service ( LOS )	D	C	C	C	C	D	C	E	C	E	D	C
Approach Delay, s/veh / LOS	38.5		D	34.7		C	52.1		D	45.9		D
Intersection Delay, s/veh / LOS	40.9						D					

Multimodal Results	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

## **Appendix N**

### **ODOT Turn Lane Warrant Graphs**

# Cook Road & Starbucks Driveway

2026 Build

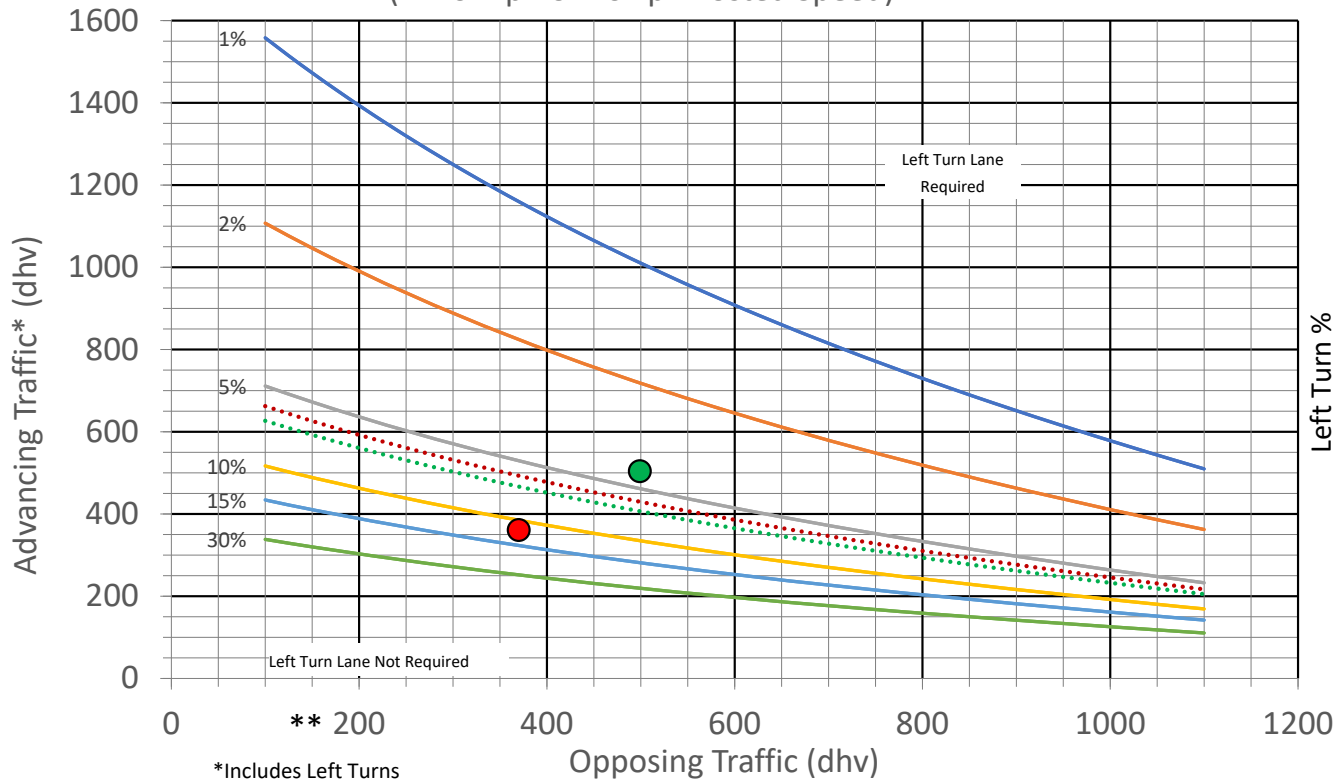
**WARRANT IS MET**

Left turn lane is warranted in the Mid-day when the red dot is located on or above the dotted red line.

Left turn lane is warranted in the PM when the green dot is located on or above the dotted green line.

## 2-Lane Highway Left Turn Lane Warrant

(=<40 mph or 70 kph Posted Speed)



\*Includes Left Turns

\*\*There is no minimum number of turns

TIME	WESTBOUND		EASTBOUND		ADVANCING	OPPOSING	LT%	WARRANT?
	LEFT	THRU	THRU	RIGHT				
● Mid-Day	21	340	270	100	361	370	5.8%	NO
● PM	33	471	422	77	504	499	6.5%	YES

**2-LANE LEFT TURN LANE  
WARRANT (LOW SPEED)**

REFERENCE SECTION  
401.6.1

**401-5aM**

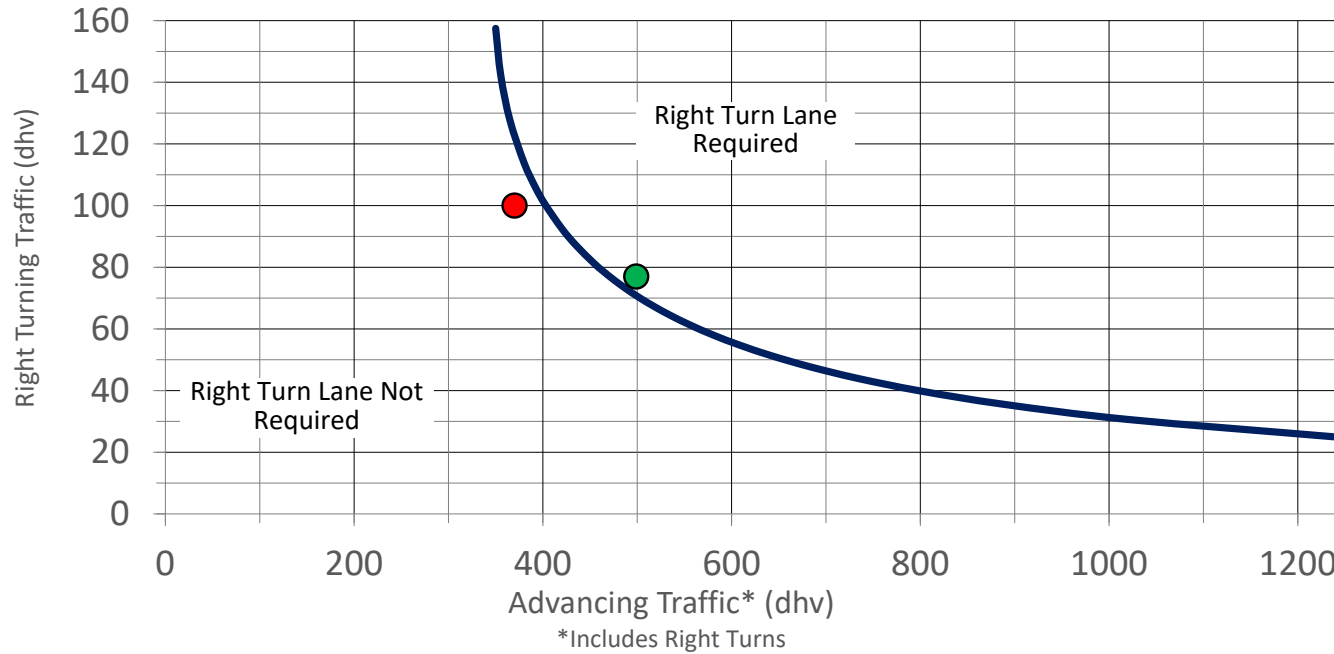
# Cook Road & Starbucks Driveway

2026 Build

WARRANT IS MET

## 2-Lane Highway Right Turn Lane Warrant

(=<40 mph or 70 kph Posted Speed)



TIME	EASTBOUND			WARRANT?
	THRU	RIGHT	ADVANCING	
● Mid-day	270	100	370	NO
● PM	422	77	499	YES

**2-LANE RIGHT TURN LANE  
WARRANT (LOW SPEED)**

REFERENCE SECTION  
401.6.3

**401-6aM**

# Cook Road & Starbucks Driveway

2036 Build

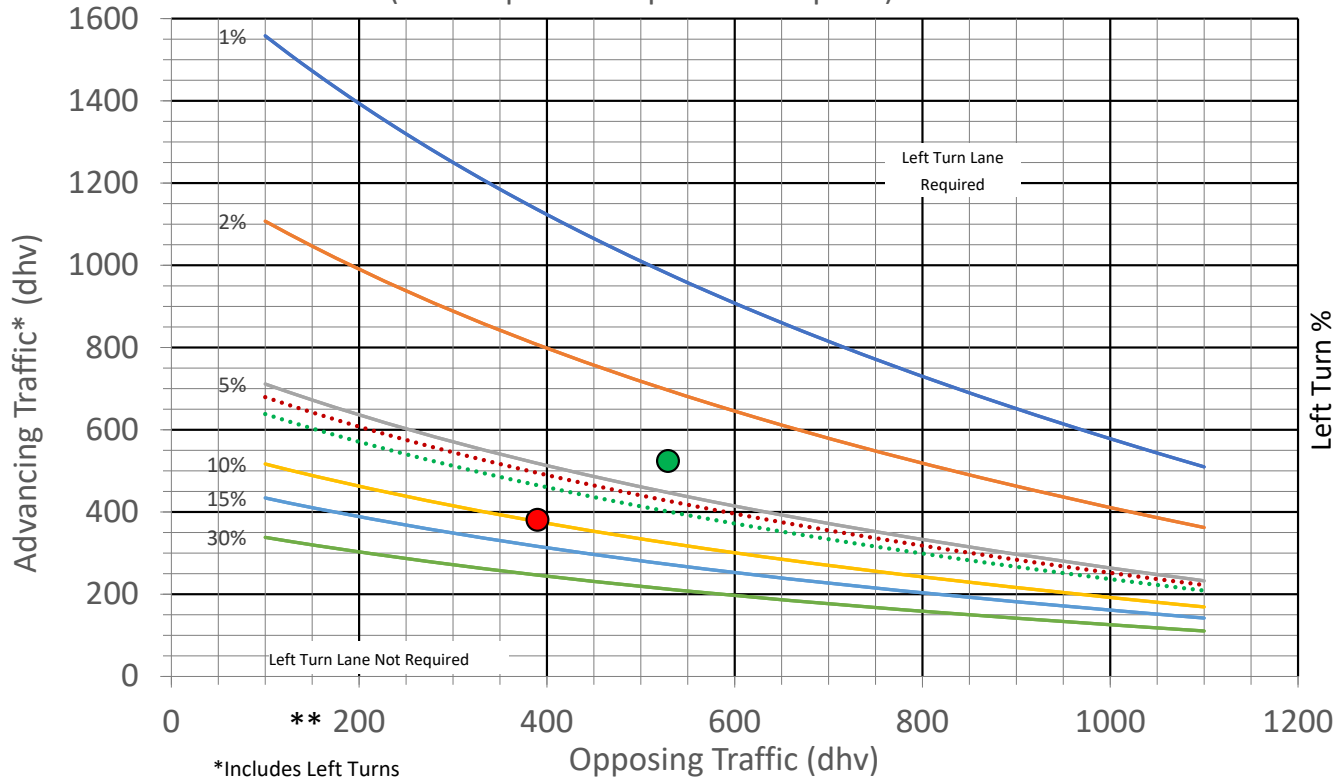
**WARRANT IS MET**

Left turn lane is warranted in the Mid-day when the red dot is located on or above the dotted red line.

Left turn lane is warranted in the PM when the green dot is located on or above the dotted green line.

## 2-Lane Highway Left Turn Lane Warrant

(=<40 mph or 70 kph Posted Speed)



\*Includes Left Turns

\*\*There is no minimum number of turns

**2-LANE LEFT TURN LANE  
WARRANT (LOW SPEED)**

REFERENCE SECTION  
401.6.1

**401-5aM**

TIME	WESTBOUND		EASTBOUND		ADVANCING	OPPOSING	LT%	WARRANT?
	LEFT	THRU	THRU	RIGHT				
● Mid-day	21	360	290	100	381	390	5.5%	NO
● PM	33	491	452	77	524	529	6.3%	YES

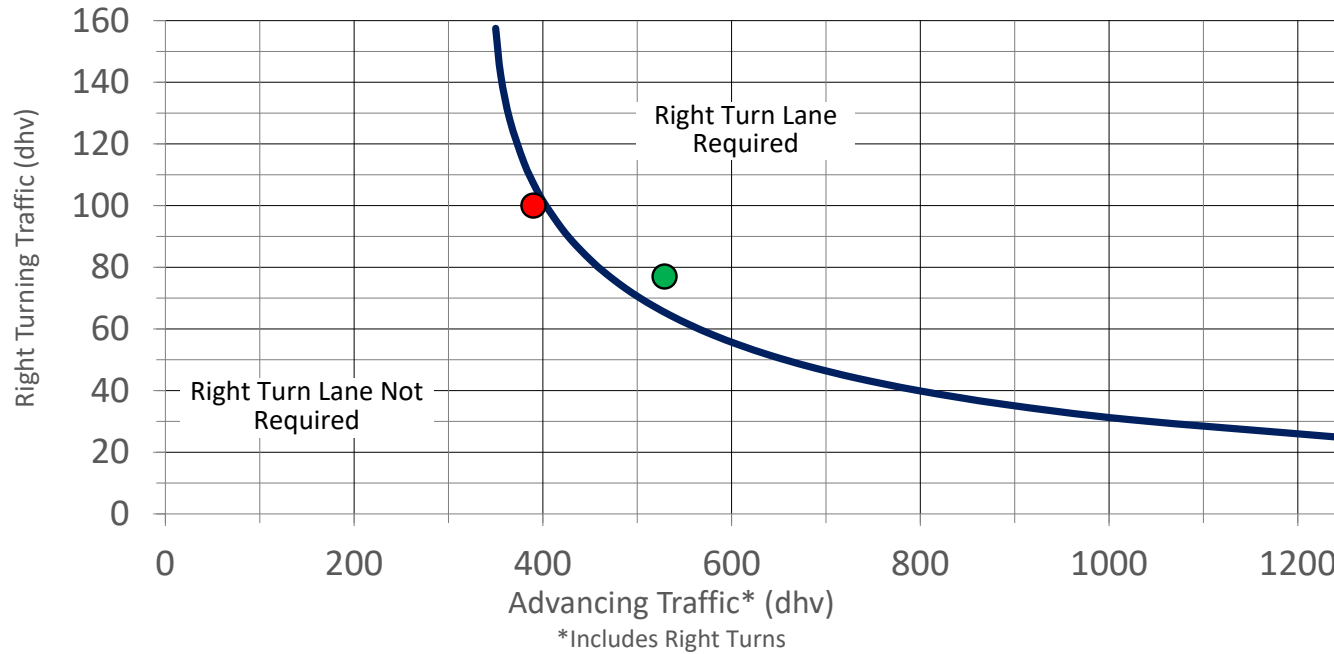
# Cook Road & Starbucks Driveway

2036 Build

WARRANT IS MET

## 2-Lane Highway Right Turn Lane Warrant

(=<40 mph or 70 kph Posted Speed)



TIME	EASTBOUND			WARRANT?
	THRU	RIGHT	ADVANCING	
● Mid-day	290	100	390	NO
● PM	452	77	529	YES

**2-LANE RIGHT TURN LANE  
WARRANT (LOW SPEED)**

**401-6aM**

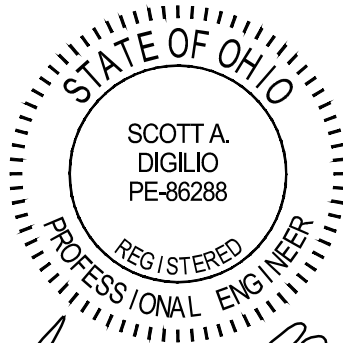
REFERENCE SECTION  
401.6.3



**PANDA EXPRESS**  
 32429 Cook Rd  
 North Ridgeville, OH 44039  
 Panda Project # D36943

**STORM WATER MANAGEMENT REPORT**  
**March 13, 2025**

Revised July 7, 2025



Prepared by:  
 RTM Engineering Consultants, LLC.  
 1933 N. Meacham Road, Suite 700  
 Schaumburg IL 60173  
 Scott A. DiGilio, PE No. 86288

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## Table of Contents

- Project Narrative
- Sewer Capacity Calculations
- Manufactured Treatment Device Information
- NRCS Web Soil Survey



## Project Narrative



## **Introduction:**

Panda Express proposes improvements to Lorain County, OH parcels 07-00-003-102-104, -45 and -46; located at 32429 Cook Rd, North Ridgeville, OH, 44039. The combined area of the three parcels is 1.092 Ac. Our project's disturbed area less than an acre. Site improvements include the construction of a restaurant building, drive-thru, parking lot, and stormwater management facilities.

## **Existing Site:**

The existing site contains an automobile repair shop with associated parking and vehicle storage.

The NRCS Web Soil Survey classifies our site's soil under hydrologic group D.

Starbucks (to our west, adjacent to our property) has provided a 15" storm sewer stub within our site, near the southwest corner.

Starbucks also has a bioretention swale that captures a portion of our site's existing runoff.

## **Proposed Stormwater:**

As under the existing conditions, under the proposed conditions we continue to allow a small portion of our runoff (0.108 Ac) to sheet flow into Starbucks' bioretention swale.

We capture the majority of our site's runoff (0.659 Ac) in a sewer that routes through a SAFL Baffle (NJDEP certified) before discharging into the designated stub in our site's SW corner. We also route 0.397 Ac of that 0.659 Ac through a proposed, on-site bioretention swale (rain garden).

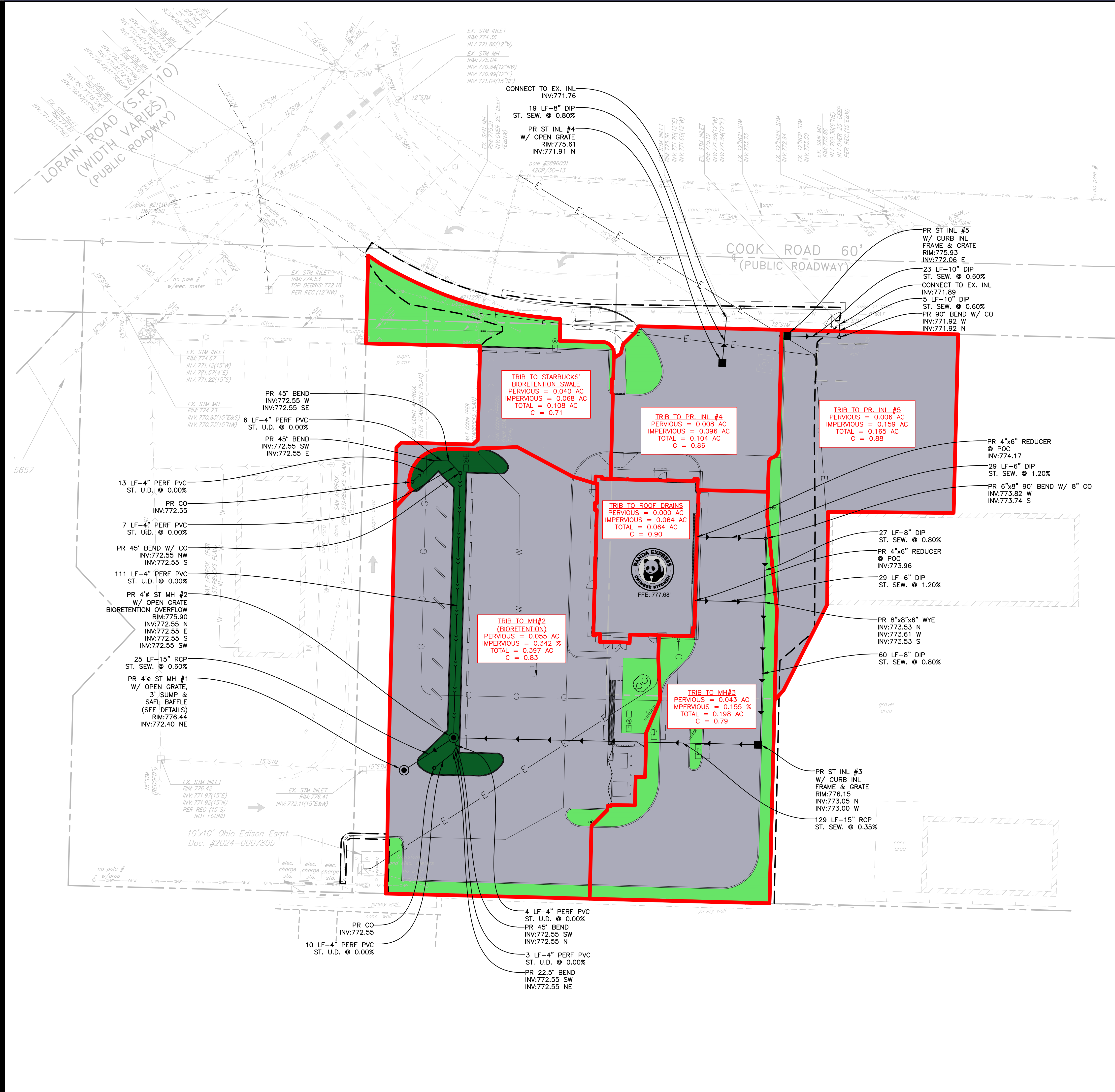
Due to low cover constraints over our proposed sewer, we drain 0.104 Ac of our site to the existing sewer to our north (after passing through a small, proposed inlet and sewer).

We also propose an inlet and short sewer segment in our eastern neighbor's site, to ensure that their runoff drains properly after our nearby modifications.



## Sewer Capacity Calculations

Users: lmare@ohhik File: C:\Users\lmare\OneDrive\RTM\Engineering\Consultants\LLC\0573.5115C-PX-N Ridgeville\OH\Project Files\03 DESIGN DRAWINGS\02 SHEET SET\X01-0-BIORETENTION EXHIBIT.dwg Time: Jul 07, 2025 - 5:28pm



**LEGEND:**

- TRIBUTARY BOUNDARY
- IMPERVIOUS AREA
- PERVIOUS AREA
- BIORETENTION AREA (PERVIOUS)



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NO.	DESCRIPTION	DATE
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2	REVISION 1	07-07-25

DRAWN BY: rtm

PANDA PROJECT #: D36943  
 PANDA STORE #: -  
 ARCH PROJECT #: 24120

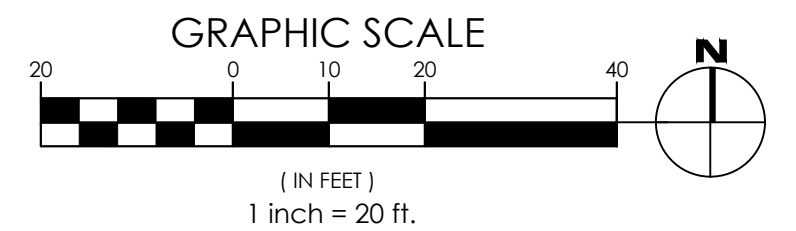
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**PANDA EXPRESS**  
 PANDA HOME R4  
 32429 COOK RD  
 NORTH RIDGEVILLE, OH 44039



**STORM SEWER & TRIBUTARY MAP**

**PIPES:**

SN	Element Description ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation	Inlet Invert Offset	Outlet Invert Elevation	Outlet Invert Offset	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (inches)	Pipe Width (inches)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	Lengthening Factor	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time (min)	Max Flow Depth (ft)	Reported Condition
1	90BEND1-WYE	90BEND1	WYE	26.71	773.74	0.00	773.53	0.00	0.21	0.8000	CIRCULAR	8.040	8.04	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	0.25	0 00:05	2.53	0.18	1.08	0.23	0.33	0.00	0.22	Calculated
2	90BEND2-EXINL2	90BEND2	EXINL2	5.47	771.92	0.00	771.89	0.00	0.03	0.6000	CIRCULAR	9.960	9.96	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	1.26	0 00:05	3.41	0.03	1.70	0.74	0.64	0.00	0.53	Calculated
3	INL3-MH2	INL3	MH2	128.81	773.00	0.00	772.55	0.00	0.45	0.3500	CIRCULAR	15.000	15.00	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	1.76	0 00:05	3.14	0.68	3.82	0.46	0.47	0.00	0.59	Calculated
4	INL4-EXINL1	INL4	EXINL1	19.03	771.91	0.00	771.76	0.00	0.15	0.8000	CIRCULAR	8.040	8.04	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	0.78	0 00:05	3.77	0.08	1.08	0.72	0.63	0.00	0.42	Calculated
5	INL5-90BEND2	INL5	90BEND2	22.77	772.06	0.00	771.92	0.00	0.14	0.6000	CIRCULAR	9.960	9.96	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	1.26	0 00:05	3.96	0.10	1.68	0.75	0.65	0.00	0.54	Calculated
6	MH2-MH1	MH2	MH1	24.89	772.55	0.00	772.40	0.00	0.15	0.6000	CIRCULAR	15.000	15.00	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	4.47	0 00:05	4.61	0.09	5.00	0.89	0.74	0.00	0.92	Calculated
7	RD1-90BEND1	RD1	90BEND1	28.88	774.17	0.00	773.82	0.08	0.35	1.2000	CIRCULAR	6.000	6.00	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	0.25	0 00:05	3.65	0.13	0.61	0.41	0.44	0.00	0.22	Calculated
8	RD2-WYE	RD2	WYE	28.88	773.96	0.00	773.61	0.08	0.35	1.2000	CIRCULAR	6.000	6.00	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	0.25	0 00:05	3.65	0.13	0.61	0.41	0.44	0.00	0.22	Calculated
9	WYE-INL3	WYE	INL3	59.81	773.53	0.00	773.05	0.05	0.48	0.8000	CIRCULAR	8.040	8.04	0.0130	0.5000	0.5000	0.0000	0.00	NO	1.00	0.49	0 00:05	3.05	0.33	1.08	0.45	0.47	0.00	0.31	Calculated

**OUTFALLS:**

SN	Element ID	X Coordinate	Y Coordinate	Description	Invert Elevation	Boundary Type	Flap Gate	Fixed Water Elevation	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Maximum HGL Depth Attained (ft)	Maximum HGL Elevation (ft)
1	EXINL1	2112221.05	626396.12		771.76	NORMAL	NO		0.78	0.00	0.42	772.18
2	EXINL2	2112268.50	626393.41		771.89	NORMAL	NO		1.26	0.00	0.54	772.43
3	MH1	2112085.66	626206.15		772.40	NORMAL	NO		4.47	0.00	0.92	773.32

**JUNCTIONS:**

SN	Element ID	X Coordinate	Y Coordinate	Description	Invert Elevation	Ground/Rim Elevation (Max)	Ground/Rim Elevation (Max) Offset	Initial Water Elevation	Initial Water Depth	Surcharge Elevation	Surcharge Depth	Ponded Area (ft <sup>2</sup> )	Minimum Pipe Cover (inches)	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Maximum HGL Attained (ft)	Maximum HGL Depth Attained (ft)	Maximum HGL Surcharge Depth Attained (ft)	Minimum Freeboard Attained (ft)	Average HGL Attained (ft)	Average HGL Depth Attained (ft)	Time of Peak Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-inches)	Total Time Flooded (minutes)
1	90BEND1	2112237.45	626303.38		773.74	776.83	3.09	773.74	0.00	776.83	0.00	0.00	29.02	0.25	0.00	774.04	0.30	0.00	2.79	773.82	0.08	0 00:05	0 00:00	0.00	0.00
2	90BEND2	2112268.36	626387.94		771.92	775.71	3.78	771.92	0.00	775.71	0.00	0.00	35.41	1.26	0.00	772.46	0.54	0.00	3.24	771.93	0.01	0 00:05	0 00:00	0.00	0.00
3	INL3	2112235.27	626216.89		773.00	776.15	3.15	773.00	0.00	776.15	0.00	0.00	22.75	1.82	1.37	773.61	0.61	0.00	2.54	773.05	0.05	0 00:05	0 00:00	0.00	0.00
4	INL4	2112219.30	626377.17		771.91	775.61	3.70	771.91	0.00	775.61	0.00	0.00	36.35	0.78	0.78	772.33	0.42	0.00	3.28	771.91	0.00	0 00:05	0 00:00	0.00	0.00
5	INL5	2112245.60	626388.51		772.06	775.93	3.87	772.06	0.00	775.93	0.00	0.00	36.49	1.27	1.27	772.60	0.54	0.00	3.33	772.06	0.00	0 00:05	0 00:00	0.00	0.00
6	MH2	2112106.49	626219.80		772.55	775.90	3.35	772.55	0.00	775.90	0.00	0.00	25.20	4.48	2.88	773.47	0.92	0.00	2.43	772.55	0.00	0 00:05	0 00:00	0.00	0.00
7	RD1	2112208.58	626304.11		774.17	777.68	3.51	774.17	0.00	777.68	0.00	0.00	36.16	0.25	0.25	774.39	0.22	0.00	3.29	774.17	0.00	0 00:05	0 00:00	0.00	0.00
8	RD2	2112207.91	626277.41		773.96	777.68	3.72	773.96	0.00	777.68	0.00	0.00	38.68	0.25	0.25	774.18	0.22	0.00	3.50	773.96	0.00	0 00:05	0 00:00	0.00	0.00
9	WYE	2112236.77	626276.68		773.53	776.68	3.15	773.53	0.00	776.68	0.00	0.00	29.78	0.50	0.00	773.85	0.32	0.00	2.83	773.61	0.08	0 00:05	0 00:00	0.00	0.00

**TRIBUTARY AREAS:**

SN	Element Description ID	Area Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	TRIB_INL3	INL3	0.20	0.7900	0.73	0.58	1.37	8.750 0 00:05:00
2	TRIB_INL4	INL4	0.10	0.8600	0.73	0.63	0.78	8.750 0 00:05:00
3	TRIB_INL5	INL5	0.17	0.8800	0.73	0.64	1.27	8.750 0 00:05:00
4	TRIB_MH2	MH2	0.40	0.8300	0.73	0.61	2.88	8.750 0 00:05:00
5	TRIB_RD1	RD1	0.03	0.9000	0.73	0.66	0.25	8.750 0 00:05:00
6	TRIB_RD2	RD2	0.03	0.9000	0.73	0.66	0.25	8.750 0 00:05:00

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PANDA STORE #: -  
ARCH PROJECT #: 24120



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**SEWER  
CAPACITY  
CALCULATIONS**



## Manufactured Treatment Device Information



**PATENT  
PROTECTED**



5201 East River Road, Suite 303  
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www.upstreamtechnologies.us  
651-237-5123

# STORMWATER SEDIMENT SOLUTION

The most cost-effective sediment capture & retention device

**SAFL Baffle is a fraction of the cost of hydro-dynamic separators with 10 times the flow rate**

## Typical comparison found on over 1,000 projects

SAFL Baffle	Hydrodynamic Separators
<p>Cost: \$5,200</p> <p>TSS Removal Efficiency: 84%</p> <p>By-Pass Flow Rate: 80 CFS</p>	<p>Cost: \$24,000</p> <p>TSS Removal Efficiency: 85%</p> <p>By-Pass Flow Rate: 8 CFS</p>
<p><b>Operates by stopping the natural vortex</b></p> <p><i>The SAFL Baffle stops the natural vortex that is created in standard sump structures, dissipating hydro energy and causing sediment to drop to the bottom of the sump. As sediment collects in the bottom, the SAFL Baffle's design prevents vortex scouring and resuspension, retaining all previously captured sediment, even during high-flow storm events <b>up to 80 cubic feet per second.</b></i></p>	<p><b>Operates by creating a vortex</b></p> <p><i>Hydro Dynamic Separators operate with flows between <b>2 to 8 cubic feet per second.</b> At greater flows, stormwater bypasses the device and <b>does not capture any sediment.</b></i></p> <p><i>Internal plastic parts are prone to vibrate and break. SAFL Baffles can be retrofitted in the existing structure for a cost-effective replacement.</i></p>

### SAFL Baffle installs in standard sump structures



### All parts fit through a standard manhole for new or retrofit projects





Patent Protected

8,715,507B2  
8,663,466B2  
9,506,237B2  
CA2742207



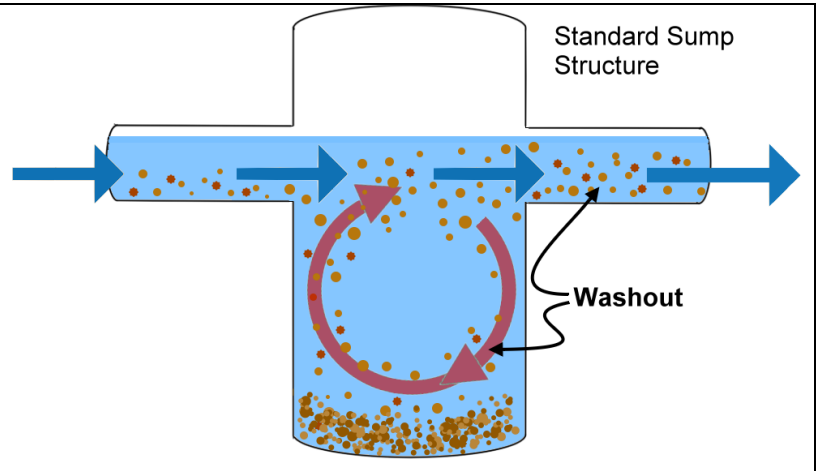
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Fridley, MN 55421  
www.upstreamtechnologies.us  
651-237-5123

## The Problem:

Standard sump structures alone can capture up to 30%\* TSS

The problem is “Washout”. During high flow events, vortex action scours the sump clean, washing out previously captured sediment.

Sediment devices must be tested for both Capture and Retention (Washout) or the overall performance of the device is unknown.



\* TSS (Total Suspended Solids) percentage is calculated based on sump size, pipe diameters, drainage area & rainfall

## Capture and Retention

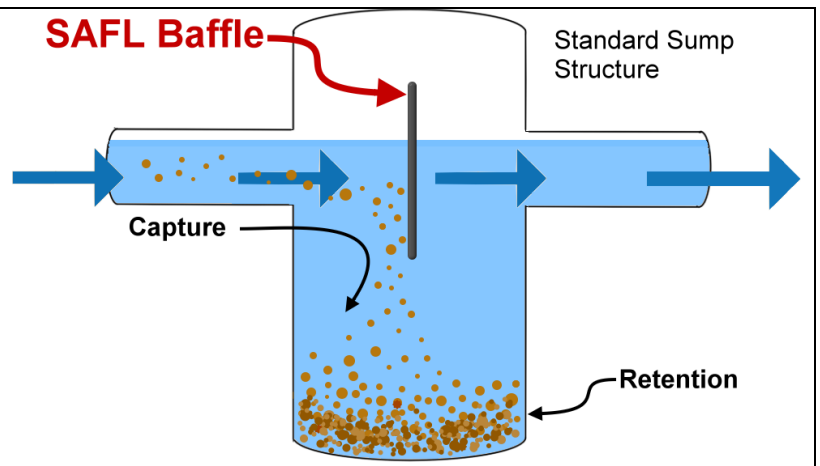
*Both capture and retention, at high flow rates, are required to adequately manage sediment.*

*What good is a sediment capture device, if the previously captured sediment washes out during a heavy storm?*

With the SAFL Baffle installed in a standard sump structure, sediment capture and ability to retain this captured sediment, exceeds 80%

Vortex action is stopped, and **washout does not occur.**

Both capture and retention are required. **The SAFL Baffle provides both.**



**Retrofittable** – Can be installed in existing sump structures with a 24-inch minimum opening.

**View a video demonstration:** [upstreamtechnologies.us/products/safl.shtml](http://upstreamtechnologies.us/products/safl.shtml)

**The SAFL Baffle is a patented device and may not be reproduced.**

US Patents: 8,715,507B2, 8,663,466B2 and US 9,506,237B2 and Canada: # 2742207

[www.upstreamtechnologies.us](http://www.upstreamtechnologies.us)

Jan 08, 2019

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## NRCS Web Soil Survey

# Custom Soil Resource Report for Lorain County, Ohio



# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

---

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

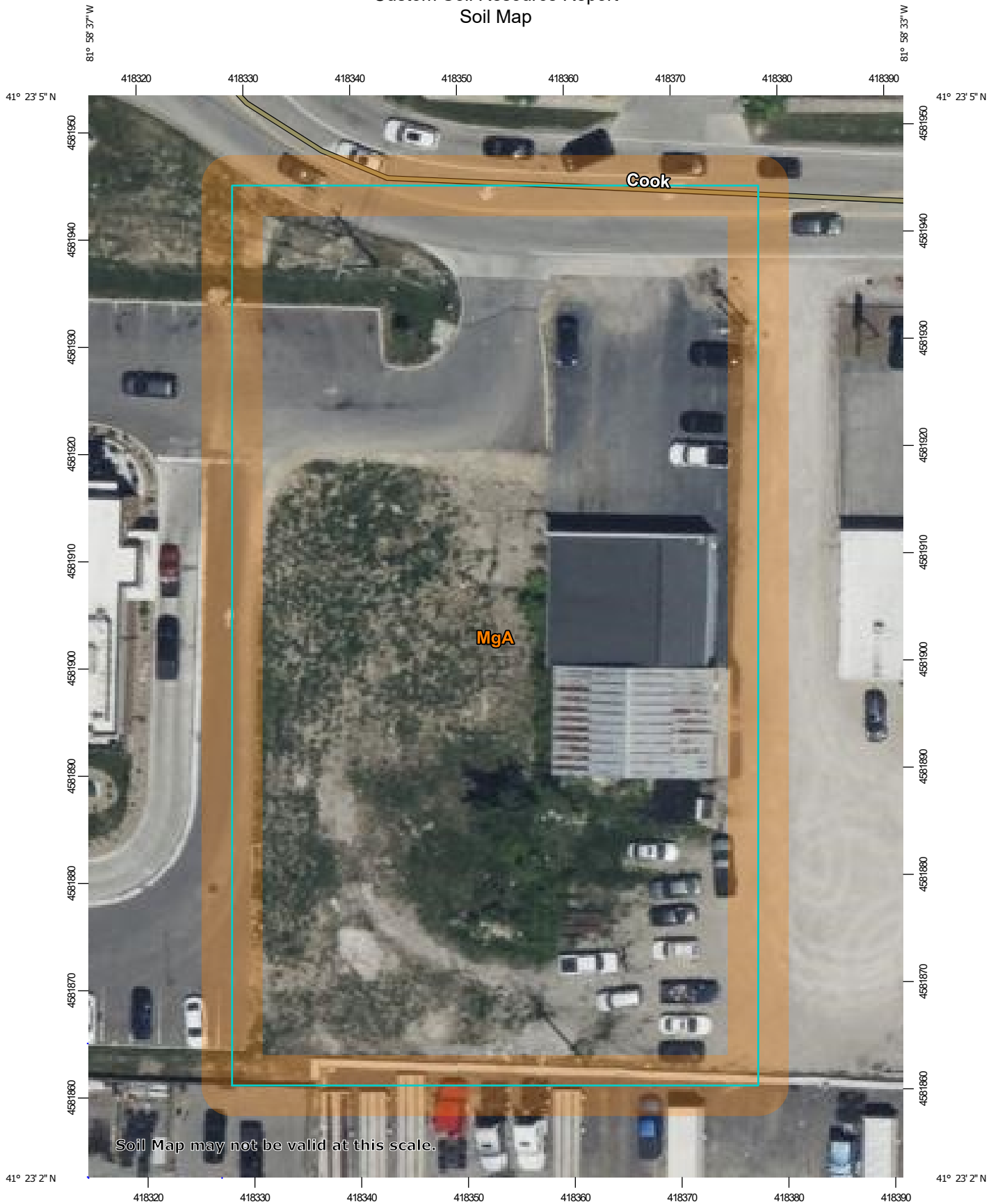
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

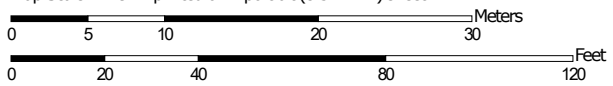
# Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.




Map Scale: 1:492 if printed on A portrait (8.5" x 11") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84


### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lorain County, Ohio  
 Survey Area Data: Version 23, Aug 28, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 21, 2023—Jun 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MgA	Mahoning silt loam, 0 to 2 percent slopes	1.0	100.0%
<b>Totals for Area of Interest</b>		<b>1.0</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

## Custom Soil Resource Report

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Lorain County, Ohio

### MgA—Mahoning silt loam, 0 to 2 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2v02z  
*Elevation:* 590 to 1,970 feet  
*Mean annual precipitation:* 33 to 52 inches  
*Mean annual air temperature:* 43 to 52 degrees F  
*Frost-free period:* 135 to 215 days  
*Farmland classification:* Prime farmland if drained

#### Map Unit Composition

*Mahoning and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Mahoning

##### Setting

*Landform:* Till plains  
*Landform position (two-dimensional):* Summit, footslope  
*Landform position (three-dimensional):* Base slope, interfluve  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Parent material:* Till

##### Typical profile

*Ap - 0 to 7 inches:* silt loam  
*Eg - 7 to 9 inches:* silt loam  
*Btg - 9 to 12 inches:* silty clay loam  
*Bt1 - 12 to 20 inches:* silty clay  
*Bt2 - 20 to 30 inches:* silty clay  
*BCt - 30 to 36 inches:* clay loam  
*C - 36 to 60 inches:* clay loam

##### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Somewhat poorly drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 6 to 12 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 15 percent  
*Available water supply, 0 to 60 inches:* Moderate (about 6.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3w  
*Hydrologic Soil Group:* D  
*Ecological site:* F139XY002OH - Moist Calcareous Drift Flats  
*Hydric soil rating:* No

**Minor Components**

**Ellsworth**

*Percent of map unit:* 5 percent  
*Landform:* Till plains  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Side slope, interfluvium  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Trumbull**

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Miner**

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

# References

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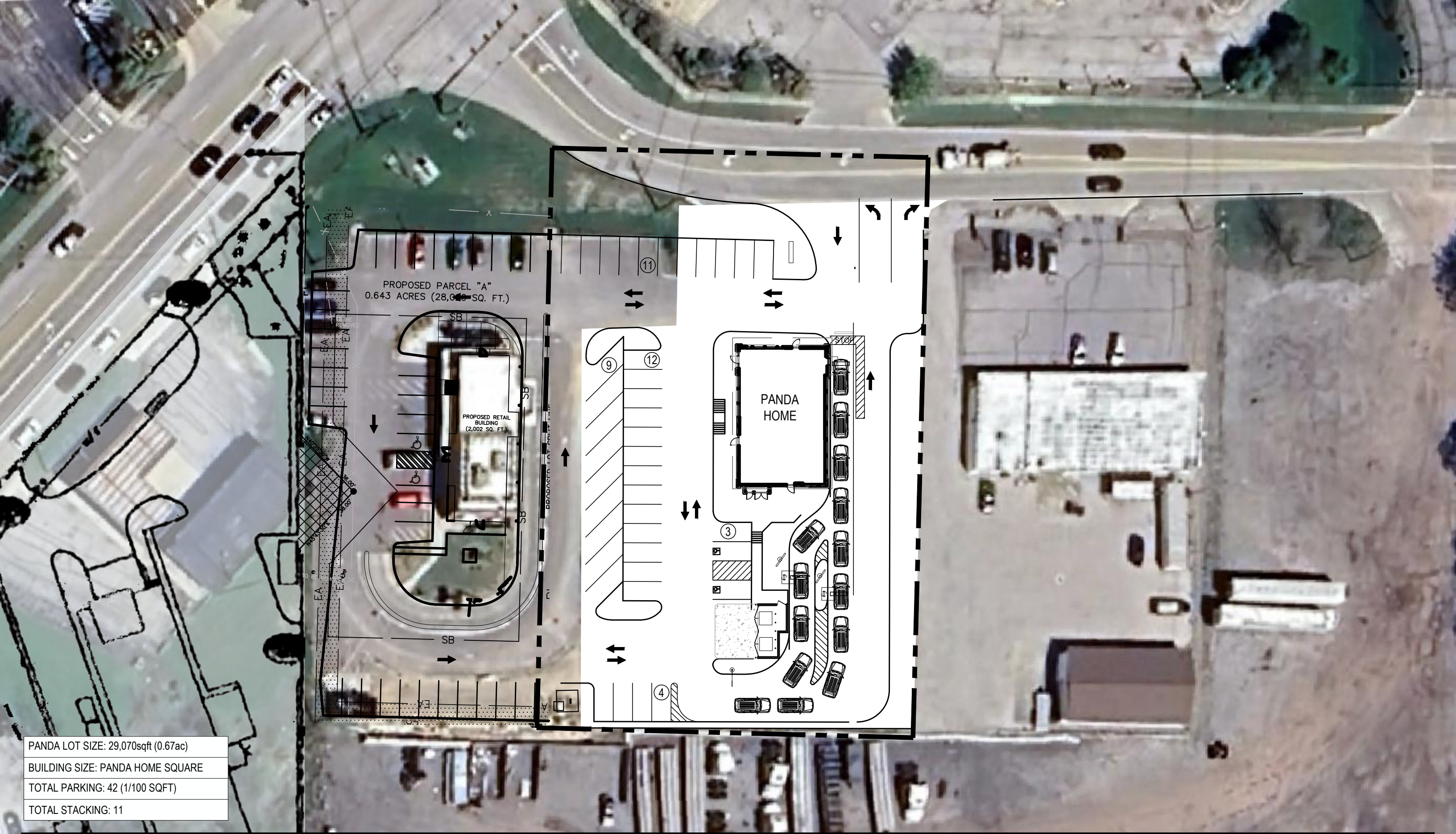
- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_054262](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262)
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053577](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577)
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053580](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580)
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2\\_053374](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374)
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

## Custom Soil Resource Report

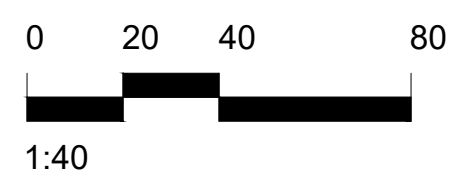
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052290.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf)



PANDA LOT SIZE: 29,070sqft (0.67ac)
BUILDING SIZE: PANDA HOME SQUARE
TOTAL PARKING: 42 (1/100 SQFT)
TOTAL STACKING: 11





To: Planning Commission

From: Kim Lieber, AICP, Director of Planning and Development

Re: Similar Use Determination Referral

Date: August 18, 2025

Code Reference:

1210.06 - Similar use determinations

(a) Since every potential use cannot be addressed in this Zoning Code, the Planning Commission shall have the authority to review those uses that are not specifically listed in a zoning district. Requests for similar use determinations shall be referred by the Planning and Development Director.

(b) The Planning Commission may determine either that a proposed use is substantially similar to another permitted use or a conditional use in a district based on the proposed use activities, character of the business, similarity to existing uses within the City and consistency with the district's purpose, or that a proposed use is not similar to other uses listed within the district. Any determination of the Planning Commission must be approved by Council.

(c) A similar use determination shall be considered an interpretation of the use regulations and not a use variance or zoning amendment. Once a use has been determined to be similar, it shall be submitted to the Clerk of Council to be codified and included in the list of uses for that zoning district.

Owner: Liberty Parkway HRD LLC

Addresses: 6287 Lear Nagle Road  
33549 Liberty Parkway

Zoning: I-2 Light Industrial District

Background:

The current owner acquired two properties in the Liberty Industrial Park in early 2024. Exterior alterations to 6287 Lear Nagle were approved in May 2024, which included new siding, painting existing masonry, adding doors and filling in the loading dock. The owner also obtained permits in summer 2024 to add new interior walls in order to create more tenant spaces.

Since that time, leasing has occurred, and businesses have opened without tenants going through the city's required new business application process. The property owner and tenants were informed of this requirement in July 2025. It is also unclear to what extent tenant improvements have been made and whether improvements or uses are consistent with the building's certificate of occupancy.

The city has been working with the owner and tenants to address this situation. However, several new business applications have been received for uses that are not among those expressly permitted uses listed in the I-2 Light Industrial District.

Those businesses include:

- White Rose Ballet Academy – ballet studio
- Gym Skills – gymnastics facility

#### Code Review:

The I-2 Light Industrial District contains a long list of permitted uses, primarily manufacturing, wholesaling, storage and warehousing. Recreation, gym or related uses are not listed by right. The I-2 Light Industrial District does, however, allow any use permitted in an I-1 Industrial Park District.

Under the category of “Special Permitted Uses” in 1274.02(h), the following uses are listed:

- (1) Cafeterias or restaurants specifically designed and intended for use by those employees and management of uses permitted in this District, but not necessarily exclusively for their use.
- (2) Bowling alleys, auditoriums, meeting rooms or other buildings primarily intended for the mutual use of the permitted uses located within this District, for meetings, programs, displays, recreation and other such uses as the industrial users of this District may deem necessary.
- (3) Outdoor recreational facilities designed and intended for use by employees and management of those industries within this District. These facilities and associated uses shall comply with the requirements of this chapter with respect to front yard, side yard and rear yard clearances. These facilities, if lighted, must be shielded away from any thoroughfares and residential districts.
- (4) Day-care facilities, branch banks and other industrial facilities to meet the needs of industrial employees.

This section does allow for certain types of recreation uses, but they appear geared towards serving the employees of the district in an accessory capacity.

#### Prior Approvals:

Gyms and other fitness related uses are located within other industrial districts in North Ridgeville, which prompted me to research how these approvals were granted. I found that the BZBA issued a similar use determination for the gymnastics facility Ten Point O on Taylor Parkway in 2004. This property is zoned I-3 Heavy Industrial District. Approvals were more recently granted for Method Sports and Fitness on Victory Lane which included gymnasiums and sports facilities in the I-2 Industrial District.

Based on the prior similar use determinations made by the BZBA, the new business application for Gym Skills was approved. However, that leaves the ballet studio. Since a code change in 2022, Planning Commission is now responsible for making similar use determinations.

As Planning Commission may have noted, our zoning code lists *very specific* permitted uses (saddle factory, sail manufacturing, scaffolds, spraying supplies equipment yard, to name a few) in the I-2 District and other districts. Past similar use approvals have followed the same granular approach. Many of these distinctions, however, are minor variations that could reasonably be grouped under broader, common categories.

It is my opinion that a ballet studio is essentially a place for physical activity, instruction and recreation, just like sports training facilities, CrossFit gyms, yoga studios or gymnastics centers. While not specifically addressed by previous similar use determinations, a ballet studio fits into the same category.

Based on prior approvals and taking this broader approach, it is my recommendation that the Planning Commission affirm and approve the similar use of ***indoor fitness and training facility*** and that this use be added to the list of permitted uses within industrial districts in the codified ordinances. Amending the code to expressly list a use once it has been determined 'similar' ensures clarity and consistency, avoiding the need for future staff or applicants to dig through old meeting minutes or parse interpretations to confirm what is allowed.

I recommend a definition be established for this use, as follows:

*"Indoor Fitness and Training Facility"* means a building or portion thereof used primarily for participatory physical activity, fitness or instructional training, whether operated for profit or not-for-profit. Examples include, but are not limited to, dance studios, yoga studios, martial arts schools, gymnastics centers, fitness studios or indoor sports training facilities. This use is distinct from *Commercial Recreation, Indoor*, which refers to facilities intended primarily for entertainment, amusement or spectator-based activities.

# Application for New Business or Change in Use



**APPLICABILITY**

Section 1243.02(b)(1) When Required. Regardless of whether or not a building permit is required for construction activities, any change of use, establishment of a new use or new business occupancy must be reviewed and issued a Certificate of Zoning Compliance.

Sections 246.16/248.04 Notification of Change in Business Owner. Whenever a business, commercial or industrial space or building changes occupants, that new occupant is required to inform both the Police and Building Departments of his or her new occupancy to enable more reliable emergency response and hazard inspection.

**APPLICANT:** Excluding signage, are you proposing any exterior changes to the building or property? Examples include building façade changes, parking lot reconfiguration, landscaping changes, lighting changes, etc. If so, **DO NOT** submit this form. Planning review is required for your project. Contact the Planning and Development Department for information about the development plan review process and submission requirements.

**BUSINESS INFORMATION**

Business name: White Rose Ballet Academy Business address: 1287 Lear Rd Unit 4

Business owner: Kaitlyn Culp Business owner email: whiteroseballetacademy@gmail.com

Business owner home address: 30413 Wolf Rd City, state, zip: Bay Village, OH 44140

Business owner phone number: 440-409-6815 Emergency phone number: 440-986-0851

**PROPERTY OWNER INFORMATION**

Property owner name: Liberty Parkway HRD LLC

Property owner address: 25255 Center Ridge Rd. City, state, zip: Westlake, OH 44145

Property owner phone: (440) 382-9777 Property owner email: commercial@cmpliving.com

**USE INFORMATION**

Previous use/occupant: Unknown Building/unit area (square feet): 1600 sq ft

Describe proposed use\*: Ballet Studio

\*Based upon the proposed use, the City may require the additional submission of a site plan showing lot configuration, building locations, provision of adequate parking and loading, driveways, etc. If a proposed use is determined to be a conditional use in a particular zoning district, development plan review and Planning Commission approval is required.

**AUTHORIZATION AND ACKNOWLEDGEMENT**

Applicant signature: [Signature] Property owner signature: [Signature]

Submit this application to the Building Division with the \$50 application fee.

I hereby authorize the City of North Ridgeville to view the premises and consent to their entry onto the property for the purpose of observing site conditions related to review of my application.

OFFICE	DD7 No.	Date Received	Amount Paid
	PP2 2025-0372	8/5/2025	50.00



- (3) Appliance store (major appliances, e.g. T.V., washing machine, and radio sales).  
~~(4) Automobile service station~~  
 (4) ~~(5)~~ Automobile repair and accessory sales.  
 (5) ~~(6)~~ Boat and marine sales.  
 (6) ~~(7)~~ Camping trailer sales and service.  
 (7) ~~(8)~~ Cemetery (minimum of ten acres); mortuary; crematory.  
 (8) ~~(9)~~ Church and professional building.  
 (9) ~~(10)~~ Clinic and professional building.  
 (10) ~~(11)~~ Drive-in bank.  
 (11) ~~(12)~~ Drive-in ice cream and soda sales.  
 (12) ~~(13)~~ Drive-in restaurant.  
 (13) ~~(14)~~ Drive-in theater.  
 (14) ~~(15)~~ Farm, fruit and produce stand (adequate off-street parking shall be provided to take care of all customers).  
 (15) ~~(16)~~ Florist shop and retail sales.  
 (16) ~~(17)~~ Food locker.  
 (17) ~~(18)~~ Funeral home.  
 (18) ~~(19)~~ Furniture store.  
 (19) ~~(20)~~ Garden and nursery center.  
 (20) ~~(21)~~ Gift and novelty shop.  
 (21) ~~(22)~~ Greenhouse.  
 (22) ~~(23)~~ Grocery and meat market.  
 (23) ~~(24)~~ Heating and plumbing materials (sales, yard).  
 (24) ~~(25)~~ Heavy equipment sales.  
 (25) ~~(26)~~ Laboratory (medical or dental).  
 (26) ~~(27)~~ Lumber yard; builders materials and supplies.  
 (27) ~~(28)~~ Monument sales.  
 (28) ~~(29)~~ Motel and hotel.  
 (29) ~~(30)~~ Office building.  
 (30) ~~(31)~~ Parking lot (subject to the provisions of Chapter 1284).  
 (31) ~~(32)~~ Pet store.  
 (32) ~~(33)~~ Customary accessory uses.  
 (33) ~~(34)~~ Any permitted use in a B-2 Central Business District.

(b) Conditional Uses. The following uses shall be deemed to be conditional uses in this district.

- (1) Bars and taverns.  
 (2) Bowling alleys, provided that the building used for such purposes shall be not less than 100 feet from any residential district.  
 (3) Swimming clubs and other commercial recreation and amusements.  
 (5) Kennels.  
 (6) Car washes, provided that there shall be a separation distance of one (1) mile between car wash businesses where the car wash is the primary use. Separation distances shall be measured by a straight line connecting the closest distance between the lots. The separation requirement shall have no application where a car wash is an accessory use.  
(7) Automobile service station, provided that there shall be a separation distance of one (1) mile between automobile service station businesses where the automobile service station is the primary use on the lot. Separation distances shall be measured by a straight line connecting the closest distance between the lots. The separation requirement shall have no application where an automobile service station is an accessory use.

- (c) Similar uses as determined in accordance with Chapter 1210, except for the following uses which are expressly prohibited:
- (1) Self-storage facilities.

**SECTION 2.** That *Section 1270.02 Permitted and Conditional Uses* in the B-4 Commercial Parkway District of the Zoning Code be amended as follows:

1270.02 PERMITTED AND CONDITIONAL USES.

- (a) A building or premises may be used for the following purposes in a B-4 Commercial Parkway District:
- (1) Automotive center (sales and service).
  - (2) Automobile service stations. **Provided that there shall be a separation distance of one (1) mile between automobile service stations businesses where the automobile service stations is the primary use. Separation distances shall be measured by a straight line connecting the closest distance between the lots. The separation requirement shall have no application where an automobile service station is an accessory use.**
  - (3) Automobile repairs (minor and major).
  - (4) Clinics and professional office buildings.
  - (5) Convention halls, auditoriums, and assembly halls.
  - (6) Gifts and novelties sale.
  - (7) Hotels.
  - (8) Laboratories (medical and dental).
  - (9) Motels.
  - (10) Night clubs, including the sale of alcoholic beverages.
  - (11) Restaurants, including drive-ins.
  - (12) Cabins and campground rentals.
  - (13) Other similar uses which serve the long-distance motoring public.
- (b) The following uses shall be deemed to be conditional uses in this district.
- (1) Boat and marine sales; construction equipment (sales and service).
  - (2) Camping trailers and mobile homes (sales only).
  - (3) Car washes, provided that there shall be a separation distance of one (1) mile between car wash businesses where the car wash is the primary use. Separation distances shall be measured by a straight line connecting the closest distance between the lots. The separation requirement shall have no application where a car wash is an accessory use.
  - (4) Farm implements (sales and service).
  - (5) Heavy equipment sales.
  - (6) Truck service.
  - (7) Truck terminals.
- (c) Single-family residential uses shall be specifically prohibited in the B-4 District, except for the dwellings of resident watchman and hotel and motel operators whose work requires their continual presence on the premises.
- (d) Similar uses as determined in accordance with Chapter 1210, except for the following uses which are expressly prohibited:
- (1) Self-storage facilities.

**SECTION 3.** That *Section 1272.04 Permitted and Conditional Uses* in the B-5 Architectural Business District of the Zoning Code be amended as follows:

**1272.04 PERMITTED AND CONDITIONAL USES.**

(a) A building or premises may be used for the following purposes in a B-5 Architectural Business District:

- (1) Ambulance service.
- (2) Antique store.
- (3) Apparel and accessories store.
- (4) Appliances (household).
- (5) Art gallery.
- (6) Automobile accessory store, sales, and service.
- (7) Bakery.
- (8) Banks (see also loan and finance offices).
- (9) Barber shop.
- (10) Barber and beauty shop supply store.
- (11) Beauty shop.
- (12) Bed and breakfast inns.
- (13) Blueprinting.
- (14) Bicycle shop.
- (15) Book store.
- (16) Business equipment and supply.
- (17) Business or trade school.
- (18) Camera and photographic equipment supply store.
- (19) Child care center.
- (20) Churches and temples.
- (21) Candy, nut, and confectionary store.
- (22) Clinic (dental or medical).
- (23) Dairy bar.
- (24) Dairy products store (bottling operations excluded).
- (25) Dance studio.
- (26) Delicatessen.
- (27) Department store.
- (28) Discount center and store.
- (29) Drug store.
- (30) Dry cleaning (custom and self-service).
- (31) Dry goods store.
- (32) Eating place, grill.
- (33) Egg and poultry store.
- (34) Floor covering.
- (35) Florist; gift shop.
- (36) Funeral home and cemetery.
- (37) Furniture; household furnishings.
- (38) Garden and lawn supplies store.
- (39) Grocery store and meat market (supermarket).
- (40) Hardware and sporting goods.
- (41) Hobby shop.
- (42) Motel.
- (43) Health salon.

- (44) Rest home.
- (45) Jewelry store.
- (46) Laboratory (dental and medical).
- (47) Laundry (custom and self-service).
- (48) Lighting fixture sales.
- (49) Liquor store (sale by package only).
- (50) Libraries.
- (51) Loan and finance offices (see also banks).
- (52) Locksmith.
- (53) Luggage store.
- (54) License bureau.
- (55) Museum.
- (56) Music store; pianos, radio, and television.
- (57) Newspaper publishing sales and service.
- (58) Novelty shop.
- (59) Office (any office in which chattels or goods, wares, or merchandise are not commercially created, exchanged, or sold).
- (60) Office supply store.
- (61) Night club.
- (62) Optician and optometrist shops.
- (63) Paint and wallpaper store; art supplies.
- (64) Parking lot, either publicly or privately owned and operated.
- (65) Post office.
- (66) Plumbing and heating shop and supplies (enclosed storage only).
- (67) Professional services.
- (68) Pressing, altering, and repair of wearing apparel.
- (69) Printing and publishing, including processes related thereto.
- (70) Private clubs and lodges; YMCA; commercial recreation; fraternal societies.
- (71) Public utility offices and salesrooms.
- (72) Repair, rental, and servicing of any product, the sale of which is permitted in this District.
- (73) Restaurant.
- (74) Resale shop; used clothing and furniture.
- (75) Shoe store (sales and repair).
- (76) Sign painting shop.
- (77) Surgical supplies store.
- (78) Surplus store.
- (79) Telephone exchange and office.
- (80) Theater and theatrical studio.
- (81) Toy store.
- (82) Travel agency.
- (83) Variety and notions store.
- (84) Wall and floor coverings store.
- (85) Cemetery.
- (86) Drive-in bank.
- (87) Drive-in ice cream.
- (88) Drive-in restaurant.
- (89) Farm, fruit, and produce stand.
- (90) Gift and novelty shop.
- (91) Office building.

- (92) Pet store, pet cemetery with flat markers only.
- (93) Customary accessory uses.
- (94) Assisted living for the elderly.
- (95) Planned unit development.
- (96) Animal clinic or animal hospital.

- (b) The following uses shall be deemed to be conditional uses in this district.
  - (1) Bowling alleys shall be deleted, except as part of a larger planned unit commercial development (PUD), with buffer strip.
  - (2) Swimming clubs and other commercial recreation and amusements, with buffer strip.
  - ~~(3) Automobile service station, with buffer strip.~~
  - ~~(4) RESERVED~~
- (c) Residences can co-exist at the same location when living quarters are maintained with a minimum of 1,040 square feet.
- (d) Existing structures converted to a business shall be grandfathered with regard to setback, side yard, and rear yard requirements, but must have "Theme Design" on three prominent sides of the building to respect the architectural theme of the District.
- (e) Similar uses as determined in accordance with Chapter 1210, except for the following uses which are expressly prohibited:
  - (1) Self-storage facilities.

**SECTION 4.** That, in all other respects, the North Ridgeville Zoning Code, as amended from time to time, shall remain in full force and effect.

**SECTION 5.** That it is found and determined that all formal actions of this Council concerning and relating to the adoption of this Ordinance were conducted in an open meeting of this Council and that all deliberations of this Council and any of its committees that resulted in such formal action were in meetings open to the public in accordance with all legal requirements, including §121.22 of the Ohio Revised Code.

**SECTION 6.** That this Ordinance shall take effect and be in full force from and after the earliest period allowed by law.

PASSED: \_\_\_\_\_

\_\_\_\_\_  
PRESIDENT OF COUNCIL

ATTEST: \_\_\_\_\_  
CLERK OF COUNCIL

APPROVED: \_\_\_\_\_

\_\_\_\_\_  
MAYOR

Councilman Bruce Abens, Ward 3 and Chair  
Councilman Clifford Winkel, Ward 4  
Councilwoman Holly Swenk, Ward 1



**COMMITTEE REPORT**  
BUILDING & LANDS COMMITTEE MEETING  
DATE: August 18, 2025

FIRST REVIEW: August 18, 2025

COMMITTEE ACTION: 3-0

2025-110 An Ordinance amending Sections 1268.02, 1270.02, and 1272.04 of the North Ridgeville Zoning Code to update use regulations for automobile service stations and gasoline stations.  
*(Introduced by Mayor Corcoran; First Reading on 07-21-2025)*

The Committee reviewed and considered 2025-110. They decided to return it to City Council for further consideration after the Planning Commission reviewed 2025-110 to provide a recommendation to City Council.

*(Clerk Notes: 2025-110 was referred to the Building & Lands Committee and the Planning Commission on July 21, 2025, for further discussion and consideration. According to the City Council bylaws, a report must be prepared after a committee meeting if any actions were taken during that meeting. As a result, Ordinance Number 2025-110, not the committee report, will be reintroduced under Second Readings on September 15, 2025, for review and consideration, including actions from the August 18, 2025 Building and Lands Committee Meeting and the September 9, 2025 Planning Commission Meeting.)*

Signed: 08/25/2025

Members of the Committee:

Member: Holly Swenk Member: Holly Swenk

Member: Clifford Winkel Member: Clifford Winkel

Chairman: Bruce Abens Chairman: Bruce F. Abens

**NORTH RIDGEVILLE CITY COUNCIL  
BUILDING AND LANDS COMMITTEE MEETING MINUTES  
CITY COUNCIL CHAMBERS – 6:15 P.M.  
MONDAY, AUGUST 18, 2025**

**To Order and Pledge of Allegiance:**

Chairman Bruce Abens called the Building and Lands Committee meeting to order at 6:15 p.m. and led the Pledge of Allegiance.

**Roll Call:**

Members present: Chairman Bruce Abens, Councilman Clifford Winkel, and Councilwoman Holly Swenk.

Others Present: Councilman Jason Jacobs, Councilman Eric Shaffer, Councilwoman Georgia Awig, Councilman Martin DeVries, Planning and Development Director Kim Lieber, Law Director Brian Moriarity, and Deputy Clerk of Council Tina Wieber.

**Action on Minutes:**

Chairman Abens asked if there were any corrections to the minutes dated August 19, 2024. No discussion was offered. The minutes stand approved as submitted.

*{Clerk notes: The Chair began with the second item of new business.}*

**Discussion regarding 2025-115:**

2025-115      An Ordinance amending Chapter 628 Fair Housing of the North Ridgeville General Offenses Code.  
(Introduced by Mayor Corcoran; First Reading on 08-04-2025)

Chair Abens asked the Planning and Development Director Kim Lieber to explain Ordinance Number 2025-115.

Director Lieber explained that a question was raised through the Council's office regarding the City's Fair Housing Board. Upon reviewing the City's Fair Housing Ordinance, it was noted that the Ordinance had originally been established in 1989 and had seen little change since. This prompted a more in-depth review, as is often the case with older legislation. Director Lieber added that the goal became not only to address the Fair Housing Board but also to ensure the Ordinance was current and aligned with both federal and state law. Maintaining a local fair housing Ordinance demonstrated the City's commitment to protecting residents' rights. It also helped the City qualify for federal funding, such as Community Development Block Grants or other HUD-funded programs.

Director Lieber noted that federal law prohibits discrimination based on race, color, religion, sex, national origin, familial status, and disability, while Ohio law also includes ancestry and military status. The City's existing Ordinance did not fully reflect these protected classes and was outdated. The updated Ordinance was designed to reflect recognized federal and state protected classes, without adding any others. The proposal is to eliminate the Fair Housing Board, which was previously staffed through the Treasurer's Office, because there was no clear understanding of its roles and duties. The Board's intended function was not related to home rehabilitation or

physical improvements, but rather to ensure access to selling, purchasing, or renting housing and to ensure that landlords met their federal obligations.

Director Lieber mentioned that neither the Board nor City officials have the expertise needed to investigate and enforce fair housing laws. The proposed Ordinance aims to promote partnerships with nonprofit organizations or other government agencies. These agencies are better equipped to handle enforcement and education, demonstrating the City's commitment. The City reached out to Lorain County, which manages fair housing through its Community Development Department, and received positive feedback about forming a memorandum of understanding or agreement to provide fair housing services for North Ridgeville. Lorain County already receives calls from across the county, including North Ridgeville. Director Lieber reiterated that the Ordinance aligns with federal and state laws, ensuring equitable housing access for all residents, reducing legal liability for the City, and creating a partnership with Lorain County for fair housing services.

Chair Abens inquired whether the Law Director had any comments.

Law Director Moriarty stated that he reviewed the proposed legislation, and it complies with current state law.

Chair Abens inquired whether any members of City Council had questions or comments.

Councilman Winkel asked if the Fair Housing Board would be dissolved under the proposed Ordinance. He understood it would no longer be in effect, noting it had not met in years and had no active members.

Councilman Winkel raised a question regarding the scope of fair housing ordinances in other jurisdictions, specifically whether they addressed housing conditions such as unsafe living environments caused by landlords. He acknowledged that such matters would normally be under the Building Department's jurisdiction.

Director Lieber clarified that, with the elimination of the Fair Housing Board, any issues not related to discrimination—such as housing conditions—would be directed to the Building Department. She added that the Department's goal is to implement a rental registration program to maintain the integrity of the neighborhoods.

Chair Abens asked if the fair housing Ordinance affects HOAs that have rules against renting properties within their HOA.

Director Lieber responded that the Ordinance does not regulate HOAs. This defines the obligations of landlords when they rent, but it doesn't require rental or prohibit rental in any way.

No further comments from the Administration or the Committee.

Moved by Winkel and seconded by Swenk to send Ordinance Number 2025-115 back to City Council for consideration as submitted.

A voice vote was taken, and the motion carried.

Yes – 3

No – 0

**Discussion regarding 2025-110:**

2025-110 An Ordinance amending Sections 1268.02, 1270.02, and 1272.04 of the North Ridgeville Zoning Code to update use regulations for automobile service stations and gasoline stations.  
(Introduced by Councilman Abens; First Reading on 07-21-2025)

Chair Abens explained his reasoning for supporting legislation to limit the number of gas stations in North Ridgeville. The following highlights his reasoning.

- While traveling throughout the city, there are a large number of existing gas stations, as well as several vacant lots and corners that could potentially accommodate more gas stations.
- Some gas stations have closed, leaving behind environmental and redevelopment challenges due to the need for soil reclamation and tank removal.
- Once a property becomes a gas station, it is difficult to repurpose if the business fails or closes.
- Although the State mandates removing underground tanks upon closure, bankruptcies often prevent proper removal, leaving the City liable. Examples include the former BP station at Center Ridge Road and State Route 83, and the Marathon station near Cook Road and Lorain Road, which remained vacant for years due to improperly removed tanks.
- The number of gas stations has a similar issue to the car washes in North Ridgeville, which have also been limited by prior legislation.
- The proposed Ordinance would not apply to gas stations that are part of a larger development project, such as Giant Eagle or Meijer.
- The legislation is a “win-win” for the city, highlighting the need for long-term planning and drawing lessons from past zoning decisions that heavily favored residential development.
- The City could limit the number of gas stations to prevent ending up with many abandoned, unusable stations until environmental cleanup is finished.

Chair Abens inquired whether the Administration had any comments.

Mayor Corcoran understood the reasoning for the legislation. He noted that the City is currently going through a zoning code change. He wants to avoid introducing legislation that would prevent a particular business from entering the city. Mayor Corcoran cautioned against trying to enforce the legislation.

Director Lieber provided the following positives and negatives of the legislation.

Positive Impacts of Ordinance:

- The Ordinance would reduce the number of gas and service stations, helping to prevent oversaturation.
- It aligned with community preferences to limit auto-oriented uses that contribute to traffic and congestion.
- Reclassifying gas stations as conditional uses would give the City, staff, and Planning Commission greater control over design, buffering, traffic flow, and lighting. Conditional use status allowed for more thorough review compared to permitted uses by right.
- The Ordinance would help preserve the character and aesthetics of commercial corridors by preventing gas stations from dominating key commercial areas.

- Limiting gas stations could gradually phase out underperforming stations.
- The Ordinance would be consistent with the City's car wash policy, the one-mile spacing requirement.

Negative Impacts and Considerations:

- Existing gas stations within one mile of another would become non-conforming under the new Ordinance. If a non-conforming station remained vacant for over a year, it could not reopen as a gas station.
- Vacant stations posed a risk of blight due to high cleanup and redevelopment costs.
- Non-conforming gas stations seeking to reopen or change ownership would need to appeal to the Board of Zoning and Building Appeals (BZBA), placing BZBA in a difficult position.
- Ordinance could impact redevelopment, especially if lenders were hesitant to finance properties that could not be rebuilt after damage.
- Lenders often requested zoning letters to confirm rebuild eligibility, and the Ordinance could complicate this for commercial properties.
- The City's non-conforming Ordinance limits expansion or continuation of non-conforming uses, which should be reviewed for compatibility.

Director Lieber encouraged thoughtful planning aligned with the City's ongoing zoning code update. She believed the Planning Commission should discuss the issue. She suggested quantifying the impact by mapping affected gas stations to understand better which properties would be affected. The zoning districts impacted by the Ordinance include B-3 and B-4, which would become conditional; B-5, which would eliminate gas stations; and B-2, which already lists gas stations as conditional, but without spacing requirements specified in the Ordinance. Further discussion is needed on how properties in B-2 would be affected and if it was overlooked.

Chair Abens inquired whether the Law Director had any comments.

Law Director Moriarty stated that he had no comments.

Chair Abens inquired whether the Committee had any comments.

Councilman Winkel suggested that, rather than immediately changing legislation, Council could consider implementing a temporary moratorium on new gas stations. This would allow time to complete the ongoing zoning code update and assess whether permanent changes were necessary.

Director Lieber noted that moratoriums typically last six months.

Law Director Moriarty confirmed that a moratorium can be renewed if needed, but extending beyond a year might present legal challenges.

Councilwoman Swenk asked whether the non-conforming status applied to car washes, referencing the corner of Lorain Road and Lear Nagle Road, where four car washes were located.

Director Lieber confirmed that similar non-conforming rules would apply.

Councilwoman Swenk remarked that the BP gas station at Center Ridge Road and State Route 83 had closed due to road widening, which had removed the gas pumps.

Mayor Corcoran explained that the BP gas station at Center Ridge Road and State Route 83 shut down voluntarily, and the soil is still contaminated. The City is exploring options to purchase that property.

Chair Abens explained that gas stations typically have a lifespan of about 30 years, after which they must be rebuilt or closed. Given economic shifts and changes in motor transportation, closures could happen sooner, potentially leaving the City with multiple vacant gas stations. The difficulty and expense of reclaiming contaminated land show the need for foresight from the City in limiting gas station development. The intent was not to limit other types of businesses, which should be evaluated on their own merits, but to address the development challenges posed by gas stations. He noted that gas stations were often the easiest development option for vacant lots along major corridors, such as Center Ridge Road, Lorain Road, and State Route 83.

Councilman Winkel agreed with the suggestion to involve the Planning Commission in reviewing the legislation.

There was consensus from the Committee that the direction was to send the Ordinance back to Council only after the Planning Commission had the opportunity to review and provide recommendations to City Council.

Mayor Corcoran mentioned that the Planning Commission might suggest various amendments, which could complicate the legislative process.

Director Lieber noted that the City's amendment ordinance process requires proposed changes to first be presented to the Planning Commission, followed by a public hearing, before the Council can vote. These steps provided opportunities for both the Planning Commission and the public to offer input and recommendations. This would allow the Planning Commission to review the Ordinance and suggest edits before the Council takes any action.

Councilwoman Swenk wanted to know the timeline for the zoning code update.

Director Lieber stated that the goal was to complete the drafting of the zoning code by the end of the year, with adoption efforts to begin in the first quarter of the following year. Preliminary drafts of district definitions and use standards had already been developed, and dimensional standards were in progress. She agreed to share early drafts with the Planning Commission to ensure alignment with the proposed Ordinance. She noted that conditional use designations were being considered for auto-oriented businesses due to their potential impact on surrounding properties. Director Lieber stressed the importance of understanding how the Ordinance might affect existing businesses, not just future development, and recommended gathering more data that impacts before taking action.

Chair Abens proposed a motion to send the Ordinance back to City Council for further consideration, following a review by the Planning Commission and a public hearing.

Mayor Corcoran clarified that the Ordinance was already under review by the Planning Commission, and depending on their feedback, amendments might be necessary.

*{Clerk notes: Chair Abens's motion to send the Ordinance back to City Council for further consideration, following a review by the Planning Commission and a public hearing, was not a formal motion because there was not a Second; however, Chair Abens withdrew the motion unilaterally.}*

Moved by Winkel and seconded by Swenk to send Ordinance Number 2025-110 back to City Council for consideration as submitted.

A voice vote was taken, and the motion carried.

Yes – 3

No – 0

**Adjournment:**

The meeting was adjourned at 6:28 p.m.

Date Approved:

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Fijabi Gallam, MMC  
Assistant Clerk of Council

DRAFT



**BRAMHALL**  
ENGINEERING &  
SURVEYING COMPANY

September 9, 2025

Kim Lieber, AICP  
Director of Planning & Development  
North Ridgeville City Hall  
7307 Avon Belden Rd  
North Ridgeville, OH 44039

Re: Ridgeville Farms, Street Name Change

Dear Ms. Lieber:

On behalf of SLK Capital Holdings, LLC, Developer and Landowner, we are requesting a street name change from Thibo Trail to **Ridgewood Way**.

Please see attached revised address exhibit for reference.

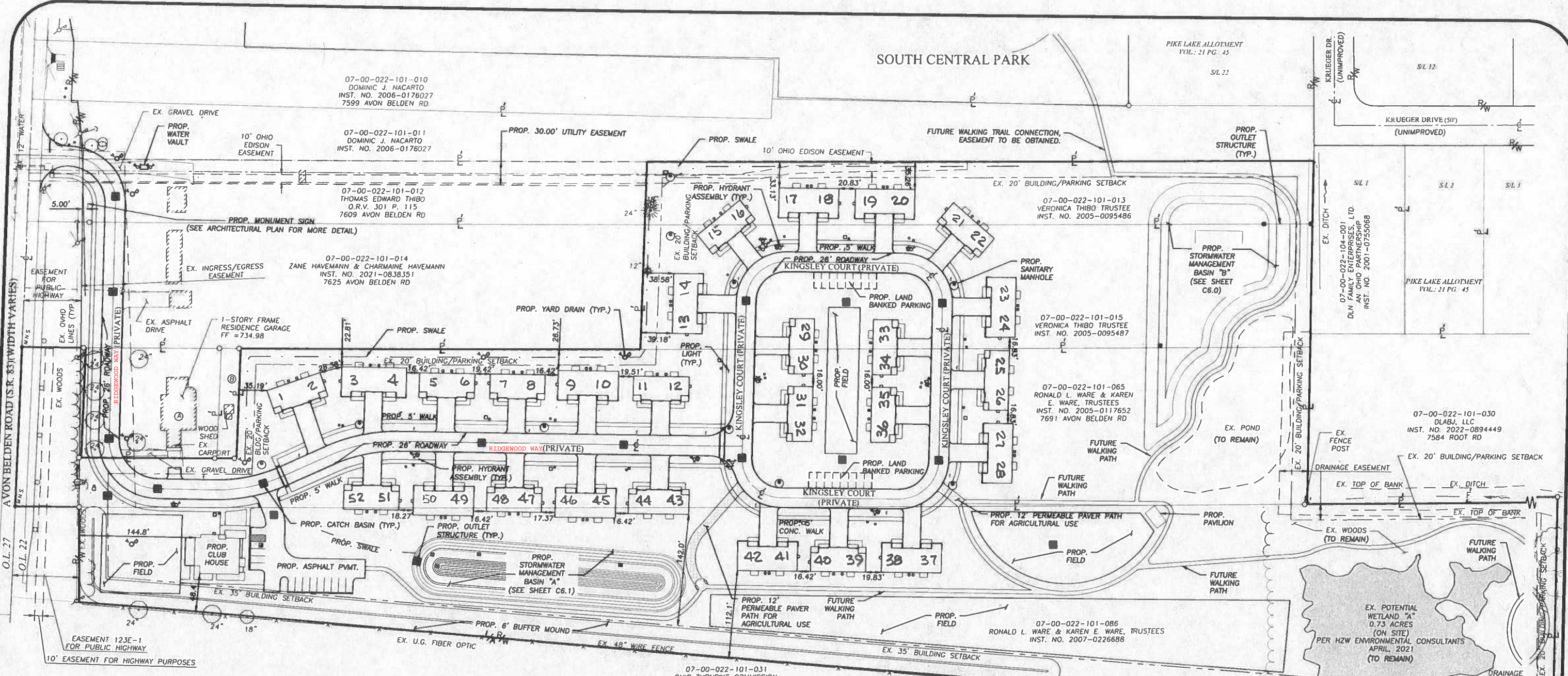
Please let us know if there are any questions.

Respectfully,

BRAMHALL ENGINEERING & SURVEYING COMPANY

Aaron P. Appell, P.E. CPESC  
Principal

Cc: Guy Fursdon, City of North Ridgeville Building Department  
Ryan Kozak, SLK Capital, LLC



- |                         |                         |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1. 35996 RIDGEWOOD WAY  | 11. 35956 THIBO TRAIL   | 21. 7646 KINGSLEY COURT | 31. 7605 KINGSLEY COURT | 41. 7694 KINGSLEY COURT | 51. 35905 RIDGEWOOD WAY |
| 2. 35992 RIDGEWOOD WAY  | 12. 35952 THIBO TRAIL   | 22. 7650 KINGSLEY COURT | 32. 7601 KINGSLEY COURT | 42. 7698 KINGSLEY COURT | 52. 35989 RIDGEWOOD WAY |
| 3. 35988 RIDGEWOOD WAY  | 13. 7614 KINGSLEY COURT | 23. 7654 KINGSLEY COURT | 33. 7657 KINGSLEY COURT | 43. 35953 RIDGEWOOD WAY | CLUBHOUSE 35999         |
| 4. 35984 RIDGEWOOD WAY  | 14. 7618 KINGSLEY COURT | 24. 7658 KINGSLEY COURT | 34. 7661 KINGSLEY COURT | 44. 35957 RIDGEWOOD WAY | RIDGEWOOD WAY           |
| 5. 35980 RIDGEWOOD WAY  | 15. 7622 KINGSLEY COURT | 25. 7662 KINGSLEY COURT | 35. 7665 KINGSLEY COURT | 45. 35961 RIDGEWOOD WAY |                         |
| 6. 35976 RIDGEWOOD WAY  | 16. 7626 KINGSLEY COURT | 26. 7666 KINGSLEY COURT | 36. 7669 KINGSLEY COURT | 46. 35965 RIDGEWOOD WAY |                         |
| 7. 35972 RIDGEWOOD WAY  | 17. 7630 KINGSLEY COURT | 27. 7670 KINGSLEY COURT | 37. 7678 KINGSLEY COURT | 47. 35969 RIDGEWOOD WAY |                         |
| 8. 35968 RIDGEWOOD WAY  | 18. 7634 KINGSLEY COURT | 28. 7674 KINGSLEY COURT | 38. 7682 KINGSLEY COURT | 48. 35973 RIDGEWOOD WAY |                         |
| 9. 35964 RIDGEWOOD WAY  | 19. 7638 KINGSLEY COURT | 29. 7613 KINGSLEY COURT | 39. 7686 KINGSLEY COURT | 49. 35977 RIDGEWOOD WAY |                         |
| 10. 35960 RIDGEWOOD WAY | 20. 7642 KINGSLEY COURT | 30. 7609 KINGSLEY COURT | 40. 7690 KINGSLEY COURT | 50. 35981 RIDGEWOOD WAY |                         |

TABLE OF OWNERSHIP		
④	07-00-022-101-046	RICHARD J. STIRZAKER TRUSTEE 7667 AVON BELDEN RD.
⑤	07-00-022-101-064	RICHARD J. STIRZAKER TRUSTEE

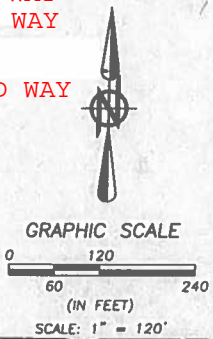
DATE	BY	DESCRIPTION
12-26-2021	APA	ISSUE TO CITY OF NORTH RIDGEVILLE
9-9-2025	APA	

**BRAMHALL**  
ENGINEERING AND SURVEYING COMPANY  
801 MOORE ROAD AVON, OHIO 44011  
(440) 934 - 7878 (440) 934 - 7879 FAX

PREPARED FOR:  
**SLK CAPITAL HOLDINGS, LLC.**  
28400 HILLIARD BLVD  
WESTLAKE, OH 44145

**RIDGEVILLE FARMS**  
SITE ADDRESS EXHIBIT  
CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN, STATE OF OHIO

SHEET  
1 OF 1  
JOB NO.  
21-5553



2025053 SLK Capital Holdings, LLC DRAWING SHEET ADDRESS EXHIBIT, Proj. Plat. Dec. 20, 2023 - 10 x 24 in.

