



TECHNICAL MEMORANDUM

Dutch Brothers Coffee Accesses on 10th Avenue and Main Street

Safety Assessment

Date: December 30, 2013 Project #: 10323.6
To: John Lewis and Aleta Froman-Goodrich, City of Oregon City
From: Hermanus Steyn, Pr.Eng., P.E. and Charles Radosta, P.E.

This memorandum provides a summary of the existing roadway and operational characteristics of 10th Avenue and Main Street in the vicinity of the Dutch Brothers Coffee site, as well as addresses safety issues presented by the City of Oregon City. Figure 1 shows a vicinity map of the study area.

Safety Issues

There have been issues regarding vehicle queues spilling back from the Dutch Brothers Coffee drive-through shop onto 10th Street. Queuing mainly affects westbound traffic; however, eastbound left-turning traffic blocks the eastbound through lane while waiting for a gap. In addition, traffic circulation issues within the Dutch Brothers Coffee site are also examined regarding access to Main Street and 10th Street.



Existing Conditions

Main Street is a two-lane minor arterial that serves as a north-south route through central downtown. 10th Street is also a two-lane east-west collector that connects historic Oregon City downtown with residential and commercial development to the east, but has a three-lane cross section in the vicinity of the Dutch Brothers Coffee site.



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**SITE VICINITY MAP
DUTCH BROTHERS COFFEE AT MAIN STREET AND 10TH STREET
OREGON CITY, OR**

**FIGURE
1**

There is a railroad crossing approximately 150 feet to the southeast of the Main Street/10th Street intersection with advance pavement markings along 10th Street. South of the railroad crossing, 10th Street becomes Singer Hill Road and increases in grade significantly to the southwest.

The Main Street/10th Street intersection is all-way stop-controlled (AWSC) that was recently upgraded to a raised concrete intersection. There is on-street parking along Main Street through historic Oregon City and in the site vicinity.



View of Main Street and the Dutch Brothers Coffee site from the west.

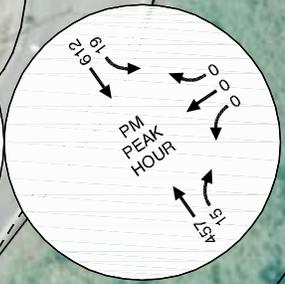
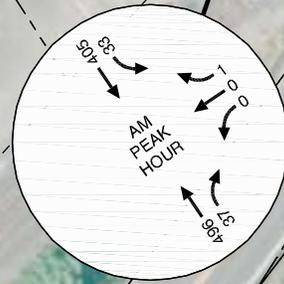
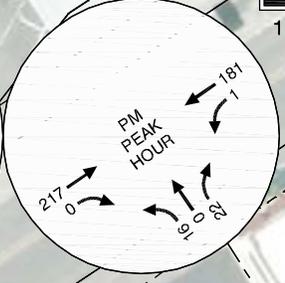
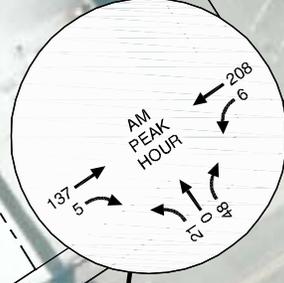
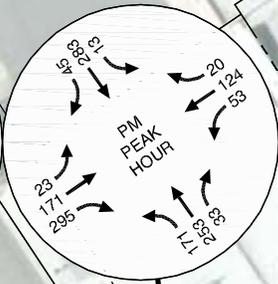
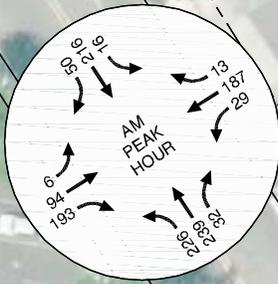


View of 10th Street and the Dutch Brothers Coffee site from the east.

Turning movement traffic counts were collected in October 2013 at the Main Street/10th Street intersection and the two Dutch Brothers Coffee accesses on Main Street and 10th Street respectively. Figure 2 summarizes the weekday morning and evening peak hour counts. The traffic counts indicate that the majority of their customers enter off 10th Street and exit onto Main Street.



1"=50'



* DUTCH BROS COFFEE

2013 EXISTING TRAFFIC COUNTS OREGON CITY, OR

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Field Observations

The project area was visited during the morning peak and afternoon peak periods. Listed below are the key observations from the visit.

- Queues of up to 5 vehicles at the coffee stand were regularly observed that triggered vehicles spilling back onto 10th Street in both the morning and afternoon site visits, and caused delays to vehicles in the westbound 10th Street through lane. It appears that the majority of the traffic entering this driveway is coming from the east. The vehicles spilling onto 10th Street would completely block the westbound lane of 10th Street.

Queue spillback blocking
westbound traffic



- There were several eastbound left-turning vehicles from 10th Street that had to wait for an appropriate gap, blocking eastbound traffic behind them. However, eastbound through traffic would often pass on the right side on the shoulder.

Vehicles passing on the
shoulder



- The westbound queues at the Highway 99E/10th Street intersection line-up in the rightmost lane to make a right-turn at the signal. The number of westbound left-turns at the Highway 99E signal and/or the Main Street intersection was minimal with two (2) or few cars at a time. The leftmost westbound lane was under-utilized during the observed weekday peak periods; although the traffic counts indicates a relatively high westbound left-turn at the 10th Street/Main Street intersection.

Queuing in rightmost lane



- The Dutch Brothers Coffee shop's driveway on Main Street is also unconventional with an exit lane (leaving the drive-through) on the wrong side of the inbound lane. This caused some operational confusion at times.

Wrong side exit



Considerations for Potential Improvements

There are a variety of possible considerations to address the safety issues along Main Street, 10th Street, and on-site circulation at the Dutch Brothers Coffee site. The potential improvements listed below have been identified to provide better guidance for drivers approaching and circulating within the site.

OPTION #1 – RESTRICTING ACCESS AND ON-SITE SIGNING & STRIPING

Consider restricting the access on 10th Street to a right-in only by introducing a raised median. This would divert the eastbound left-turns to access the site from Main Street. The majority of the traffic currently exits onto Main Street and no "outs" onto 10th Street was observed. This would not address the queue spillback into the westbound through lane for traffic entering the site from the east. However, onsite signing and striping may be considered to direct the traffic to form two queues to then feed the single drive-through lane. This option is illustrated in Figure 3. Consideration was also given to closing the driveway on 10th Street, but the onsite circulation patterns as well as the driveway operations on Main Street would be negatively impacted due the entering and exiting paths crossing each other.



1"=50'

10th St

Main St

CONVERT DRIVEWAY TO "RIGHT-IN" ONLY



PROVIDE RAISED MEDIAN

FORM 2 LINES

* DUTCH BROS COFFEE

**OPTION #1
RESTRICTING ACCESS AND ON-SITE SIGNING & STRIPING
OREGON CITY, OR**

**FIGURE
3**

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OPTION #2 – RESTRIPING 10TH STREET AND ON-SITE SIGNING & STRIPING

Consider re-striping 10th Street to provide for a two-way center-turn lane to access the driveway into Dutch Brothers Coffee. The center left-turn lane will allow for drivers to wait in a designated area to make the left into the site, rather than blocking eastbound through traffic behind them. Option #2 slightly changes the operations of 10th Street between Highway 99E and Main Street. This suggested modification will have to be coordinated with ODOT. As suggested as part of Option #1, onsite signing and striping may be considered providing more direction for accommodating longer queues on-site. This option is illustrated in Figure 4.

OPTION #3 – RECONFIGURATION OF SITE LAYOUT AND RELOCATION OF BUILDING

Consider relocating the Dutch Brothers Coffee building to the southern end of the site and modifying the on-site circulation. The access on 10th Street will be closed, and the access on Main Street will be modified to accommodate the new circulation pattern eliminating the crisscross traffic at the current driveway. A drive-through circulation route will be defined with curbs, and allow for safer movements through the site. The site modification will also allow for additional vehicles to queue in the drive-through lane onsite. This alternative is illustrated in Figure 5. This conceptual layout accommodates a passenger vehicle. This option would trigger an extensive onsite mitigation process.

OPTION #4 – RECONFIGURATION OF ON-SITE CIRCULATION

Consider reconfiguring the on-site circulation by maintaining the Dutch Brothers Coffee building in its current location. The access on 10th Street will be closed. The access on Main Street will be unconventional with vehicle exiting on the right-side of entering vehicles. The site modification will also allow for additional vehicles to queue in the drive-through lane onsite. This alternative is sketched in Figure 6.

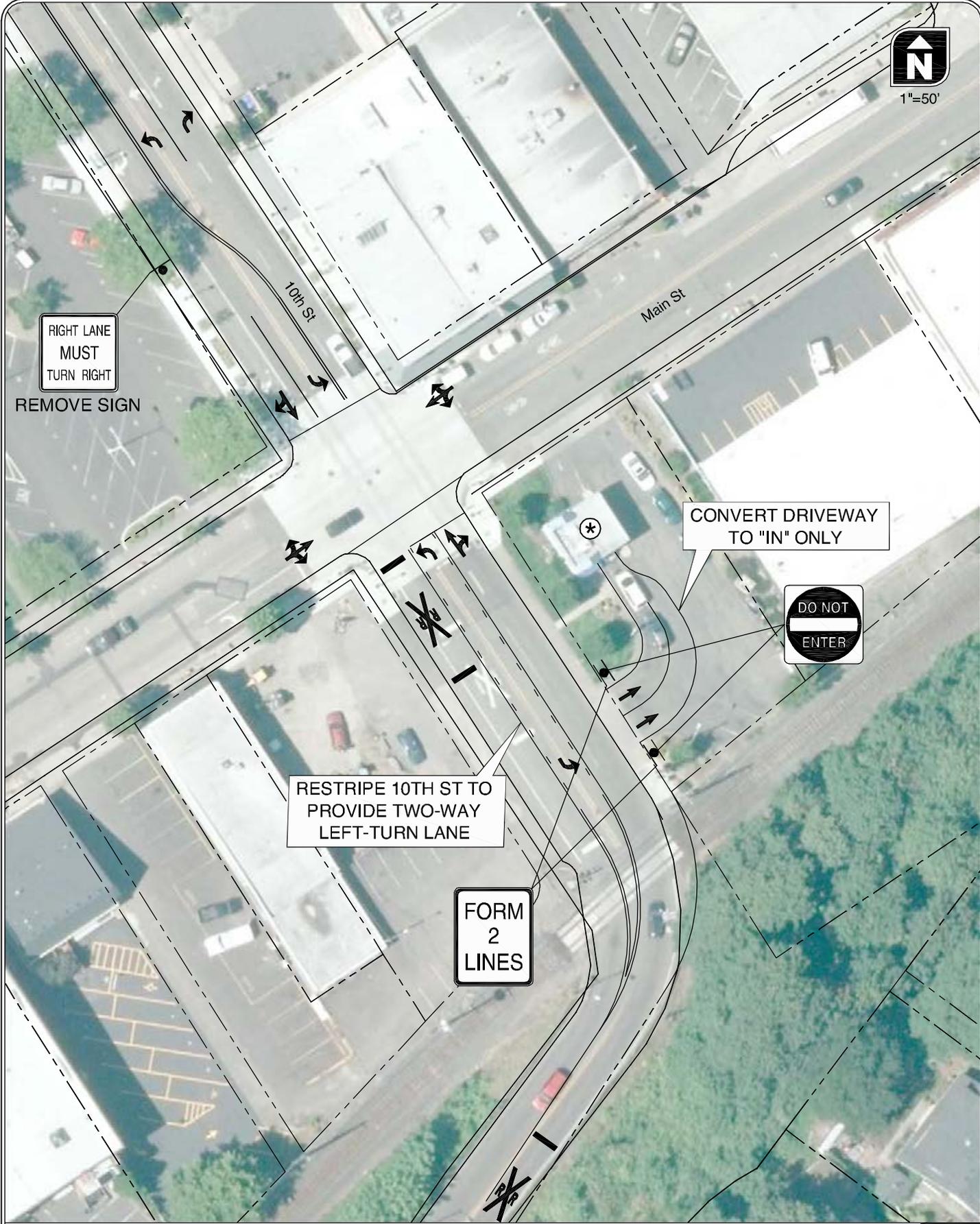
OPTION #5 – RESTRIPING 10TH STREET PROVIDING LEFT-IN

Consider re-striping 10th Street to provide for a short left-turn lane to access the driveway into Dutch Brothers Coffee. This option formalizes the current traffic behavior - the left-turn lane will allow for drivers to wait in a designated area to make the left into the site, rather than blocking eastbound through traffic behind them. On-site signing and striping may be considered providing more direction for accommodating longer queues on-site. This option is illustrated in Figure 7.



1"=50'

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(*) DUTCH BROS COFFEE

RESTRIPE 10TH STREET AND ON-SITE SIGNING & STRIPING OREGON CITY, OR

OPTION #2

FIGURE

4



1"=50'

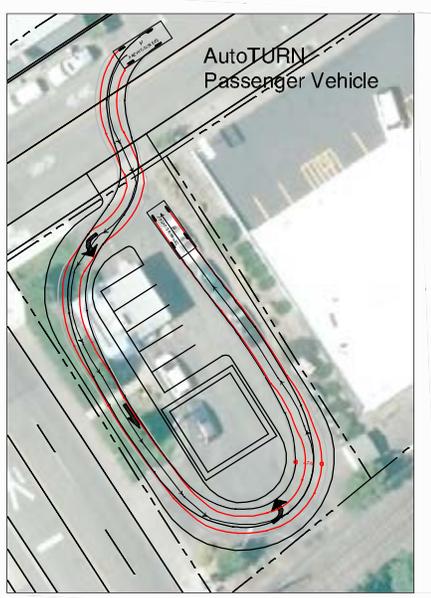
10th St

Main St

FULL ACCESS
COMMERCIAL DRIVEWAY

RELOCATED SHOP

CLOSE ACCESS



* DUTCH BROS COFFEE

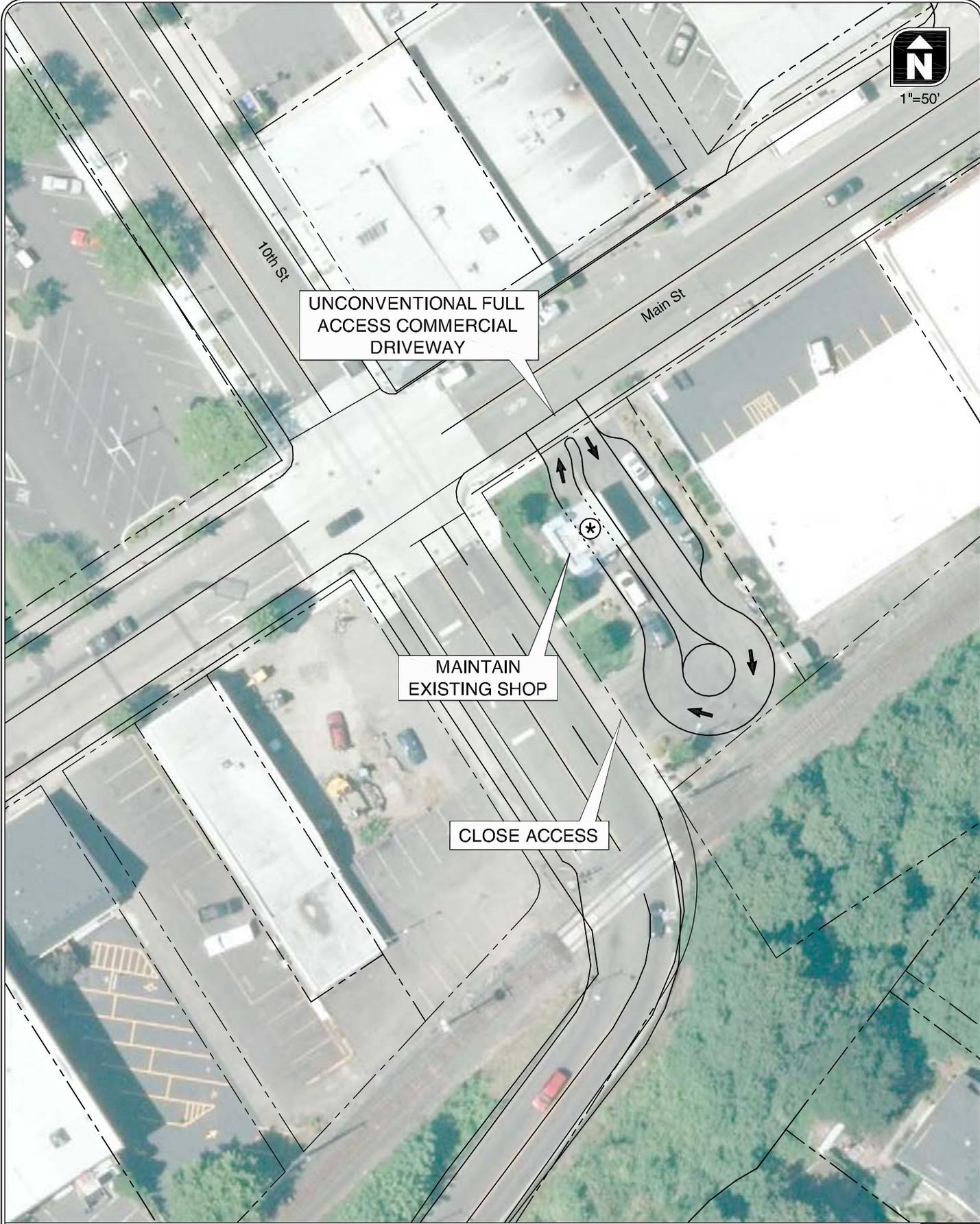
OPTION #3
RECONFIGURATION OF SITE LAYOUT
OREGON CITY, OR

FIGURE
5

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1"=50'



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★ DUTCH BROS COFFEE

OPTION #4
RECONFIGURING ON-SITE CIRCULATION
OREGON CITY, OR

FIGURE

6



1"=50'

EXIT ONLY

10th St

Main St

RESTRIPE 10TH ST TO PROVIDE LEFT-IN

CONVERT DRIVEWAY TO "IN" ONLY

FORM 2 LINES



* DUTCH BROS COFFEE

OPTION #5
INTRODUCE LEFT-TURN POCKET ON 10TH STREET
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FIGURE
7

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Recommendations

Based on the cost and complexity associated with some of the options, Option #5 (Restriping 10th Street Providing Left-In) appears to be the preferred option due to the following reasons:

- Restriping 10th Street addresses the eastbound left-turn current blocking eastbound through.
- Converting the driveway to “IN ONLY” provides the opportunity to accommodating longer queues on-site and reduce the queue spilling back onto 10th Street.

If you have any questions/comments related to this assessment, please do not hesitate to contact us at (503) 228-5230.