TECHNICAL MEMORANDUM
MULTI-COMMUNITY PLANNING:
ELEVEN MILE RD AND COOLIDGE HWY

Prepared for:

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BACKGROUND

The cities of Oak Park, Huntington Woods, and Berkley located in Oakland County, Michigan, have embarked on a joint planning effort focusing on improvements to the Eleven Mile Rd and Coolidge Highway corridors. The planning limits of the Eleven Mile Rd corridor are from Greenfield Rd to Woodward Ave, and the Coolidge Highway limits are from Nine Mile Rd to Twelve Mile Rd. Throughout the corridors there are distinct differences in the character of the roadway, including traffic volumes, on-street parking, right of way width, and adjacent land use. Therefore, the corridors were broken into five segments based on the general character of each segment when evaluating potential improvements; the corridor segments are illustrated by color coding in Figure 1.

This technical guidance document is intended to be used in conjunction with previously published planning documents within the communities when proceeding with design for future infrastructure improvements.

CORRIDOR PLANNING OBJECTIVES

The objectives for this planning effort specifically studied three elements that may be implemented uniformly through the corridors toward creating a cohesive flow between the three communities:

1. Green infrastructure
2. Lane modifications, including a road diet
3. Improving non-motorized access and connectivity

Gathering public input was an important aspect of this effort to ascertain opinions and priorities of residents and business owners. Public engagement workshops were held within each municipality to obtain input on these potential improvements. The public engagement workshops were held on February 26, 2019 (Oak Park), February 27, 2019 (Huntington Woods), and March 14, 2019 (Berkley). A summary of all written public comments is attached in Appendix 6.

GREEN INFRASTRUCTURE

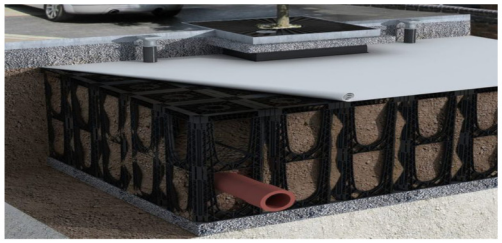
The rain event of August 2014 still weighs heavily on the minds of residents in these three communities. That 500-year storm was devastating to the Detroit area, but communities with combined storm and sanitary sewer systems; like Berkley, Huntington Woods and Oak Park, were more greatly impacted.

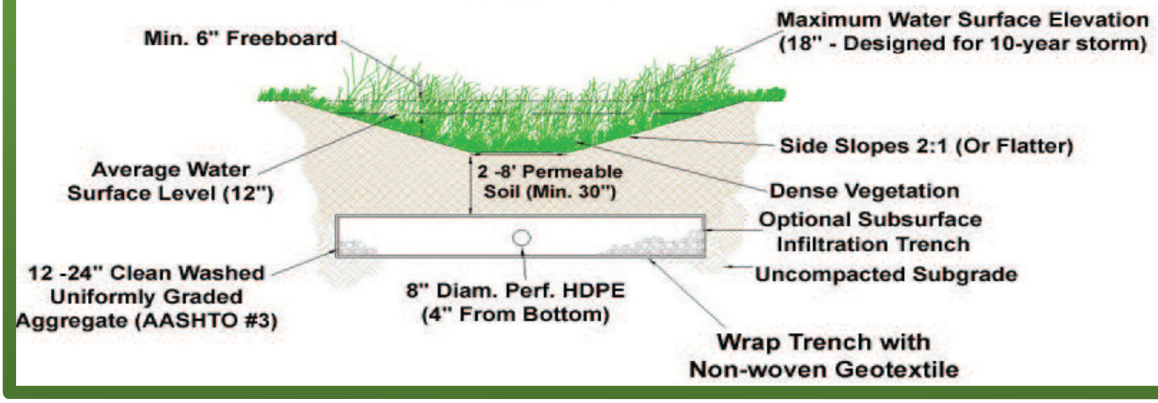
Any opportunity to redirect or slow storm water from entering the sewer system helps to alleviate the surge or peak flow which can overwhelm the pipe network and can lead to basement backups. Green infrastructure initiatives involve slowing down or redirecting water infiltration and these concepts were well received by attendees at the public engagement workshops.

Examples of possible improvements include bioswales (linear and localized), bioretention, vegetated swales, increased tree canopy, sidewalk gardens, and pervious pavement. This is not an all-inclusive list. Please see the Green Infrastructure Glossary attached in Appendix 1. Specific treatments that were suggested for each corridor are outlined in the following sections.

Green Infrastructure

- Bioswales (localized, linear)
- Bioretention
- Vegetated swales
- Infiltration basin
- Tree canopy
- Sidewalk gardens
- Pervious Pavement (non-vehicular surfaces)





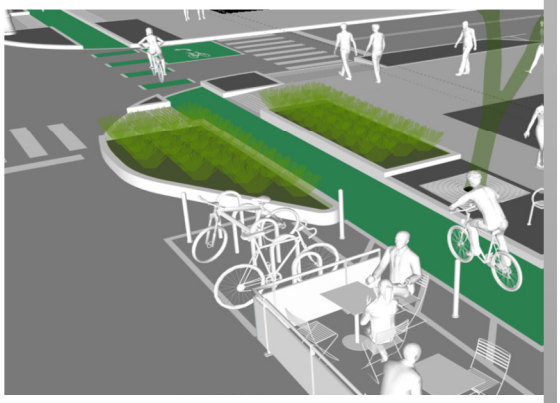
LANE MODIFICATIONS

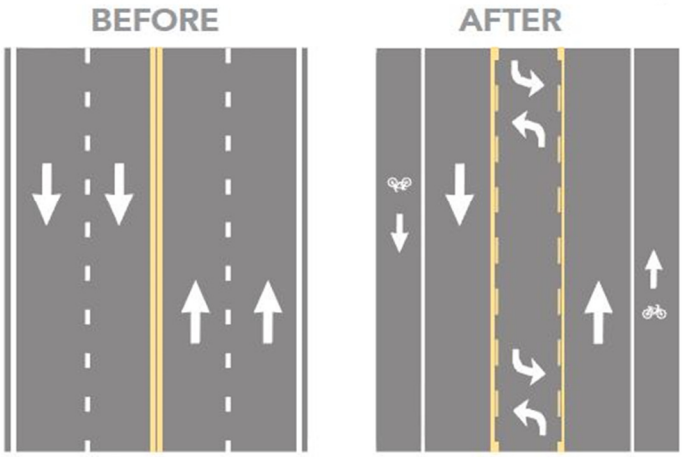
This evaluation considered different operation or uses of the existing roadway pavement, such as narrowing lanes, eliminating lanes (road diet), adding or removing on-street parking lanes, reducing the pavement footprint (long term), or using paved areas for other purposes, such as bike lanes or gathering spaces. Eliminating a lane or lanes (a road diet) creates the most opportunity for repurposing the public right of way. The Transportation Improvement Association (TIA) conducted traffic analyses of each corridor to determine if a road diet is feasible. See the attached TIA reports for reference in Appendices 2, 3, and 4. With the exception of Coolidge Highway between Nine Mile Rd to Ten Mile Rd (I-696), a road diet is feasible in both corridors. A road diet reduces the number of through lanes to allow other uses within the public right of way which may offer numerous benefits including:

- Traffic calming, reducing vehicle weaving
- Reducing number of lanes a pedestrian has to cross
- Adding a center left-turn lane (CLTL) to reduce head-on crashes and rear-end crashes
- Adding bicycle lanes to provide a dedicated space for users and increase motorists' awareness that they are present on the roadway
- Improved emergency response services by allowing emergency vehicles to pass stopped vehicles via the CLTL and avoid weaving around vehicles
- Provide the opportunity to add green infrastructure in the public ROW

Lane Modifications

- Designated bike lanes
- On street parking
- Reduced lane widths
- Reducing pavement footprint
- Buffer zones
- New uses of space





Classic Road Diet Conversion.

NON-MOTORIZED ACCESS AND CONNECTIVITY

Each community has its own unique planning document that addresses pedestrian or bike routes within its geographic boundary. A map illustrating existing and proposed bike routes is shown on the following page. This multi-community planning effort seeks to improve connectivity between the communities by identifying locations where users most frequently cross Eleven Mile Rd or Coolidge Highway to access nearby destinations.

During the public engagement workshops, participants were asked to map specifically where they cross each corridor, and whether they cross on foot or on bike. With an understanding of those preferred crossing locations, enhancements can be recommended where they can serve the most users, such as ADA upgrades, lighting, signage or channelization to guide pedestrians or bicyclists to the crossing. The map generated by participants' input is attached, illustrating all crossing locations that were identified, along with the trip origins and destinations in Appendix E.

The most popular locations to cross Eleven Mile Rd include:

- Tyler St/Buckingham Ave
- Coolidge Hwy
- Mortenson Blvd/Scotia Ave
- Standford Rd/ Meadowcrest Blvd

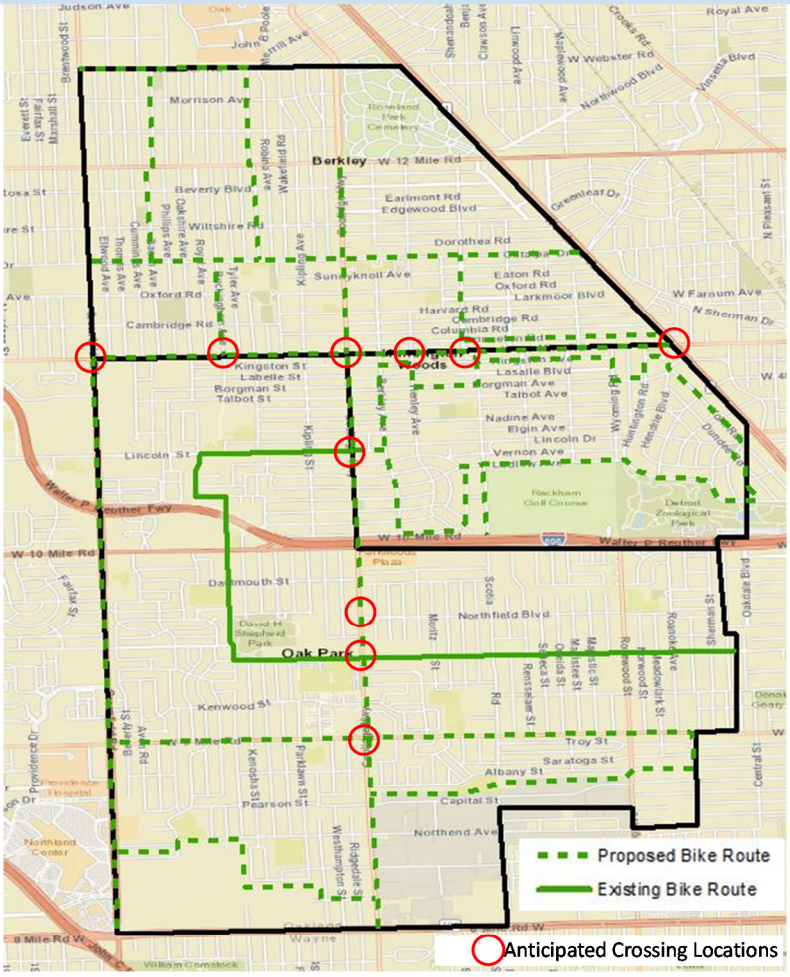
The most popular locations to cross Coolidge Highway include:

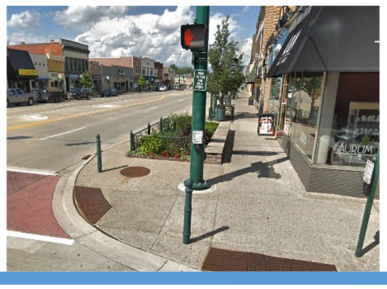
- Oak Park Blvd
- Eleven Mile Rd
- Catalpa Dr
- Lincoln St/Dr
- Harvard Rd
- Twelve Mile Rd

Other crossing locations were also identified, but these were the locations that were most frequently used.

Non-Motorized Access and Connectivity

- Enhance access points at borders
- Achieve ADA Compliance
- Improve regional connectivity
- Improve safety at crosswalks
- Sidewalk gardens





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PUBLIC COMMENTS

During the public engagement workshops, participants were encouraged to provide written comments regarding the proposed improvements. Twelve respondents provided multiple comments, and some respondents submitted their comments via email. The actual comment sheets are attached and a summary of the comments is provided below:

	In Favor				Against			
Comment Topic	OP	HW	BK	**All**	OP	HW	BK	**All**
Green Infrastructure	2	2	3	**7**				**0**
Road Diet	2	2	2	**6**	1		2	**3**
Bike Lanes	3	2	2	**7**			1	**1**
Crosswalks	2	2	3	**7**				**0**

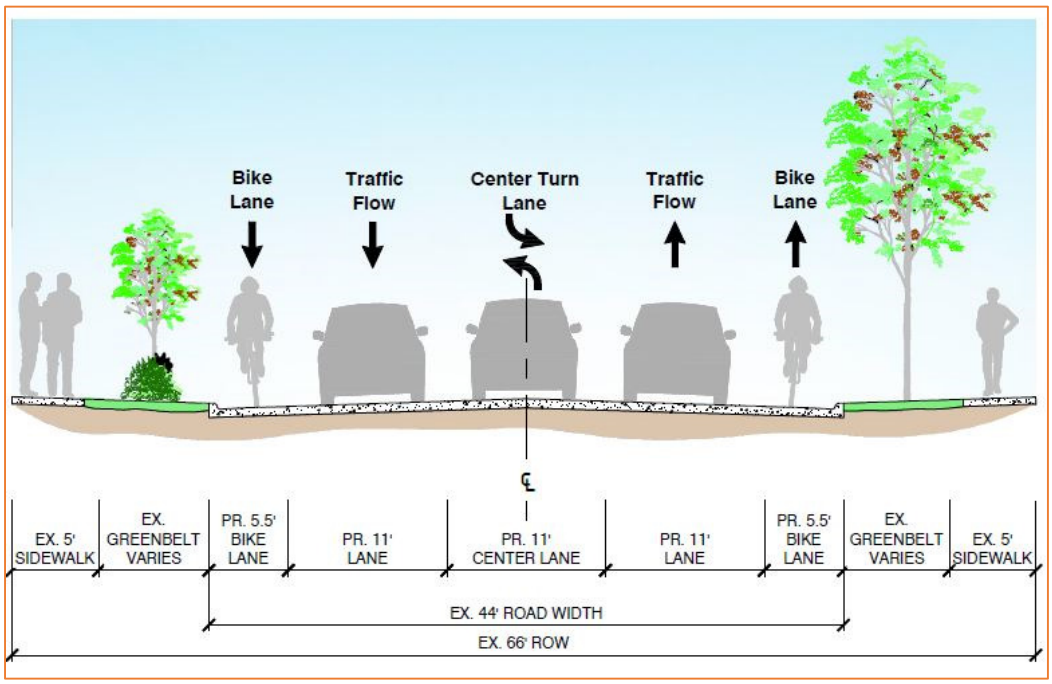
There were multiple attendees that did not fill out a comment sheet, but provided comments verbally. Most verbal comments were for clarification purposes, and turned positive once the resident's concerns were addressed. The attendance of each meeting is shown below.

Attendees	
Oak Park (2-26-19)	16
Huntington Woods (2-27-19)	11
Berkley (3-14-19)	14
Emailed Comments	3

Other Comments:
Traffic will divert onto residential streets (2)
Homes on Coolidge Hwy need on-street parking (1)

RECOMMENDATIONS FOR EACH CORRIDOR SEGMENT

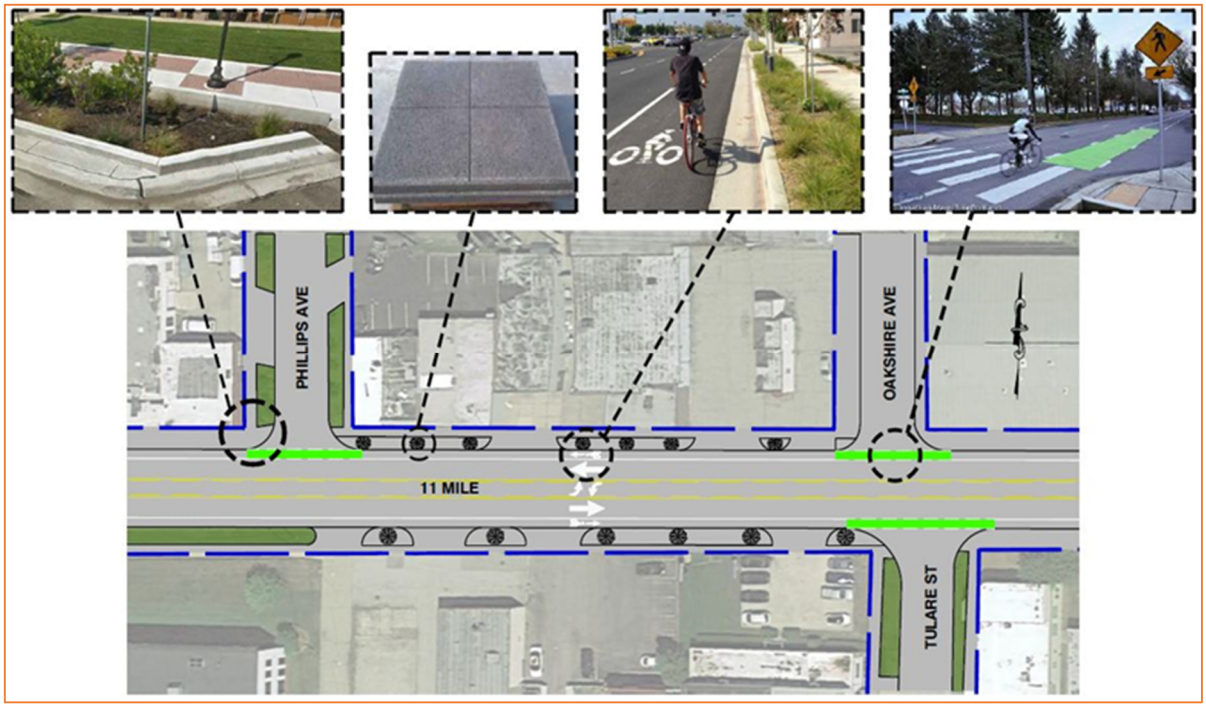
Eleven Mile Rd: Greenfield Rd to Coolidge Hwy



This segment is primarily commercial with limited greenbelt areas. Specific improvements should include:

- Additional street trees
- Murals or public art displays
- Bioswales at street Intersections
- Pervious pavers behind curbs
- Enhanced crosswalk at:
  - Tyler St/Buckingham Ave
  - Coolidge Hwy
- Road diet
- On-street bike lanes; maintain sidewalks
- Signal Modernization at Eleven Mile Rd and Greenfield Rd

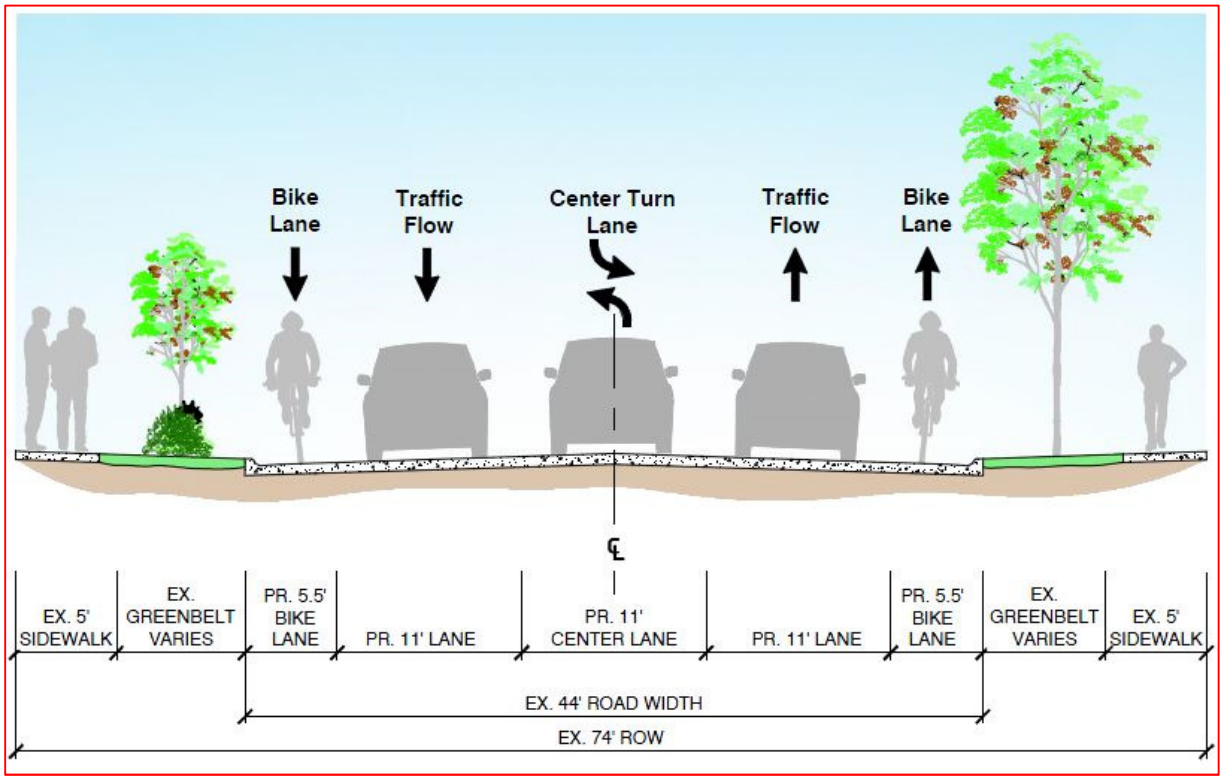
It is feasible to convert the existing 4-lane road into a 3-lane cross section, as shown here:



Some example locations include:

- Additional Street trees between the sidewalk and street in the 2800 block of Eleven Mile Rd
- Mural painted on brick exterior building similar to 3861 Twelve Mile Rd
- Bioswale at the intersection of Royal Ave and Eleven Mile Rd
- Pervious pavers between the sidewalk and street in the 3000 block of Eleven Mile Rd

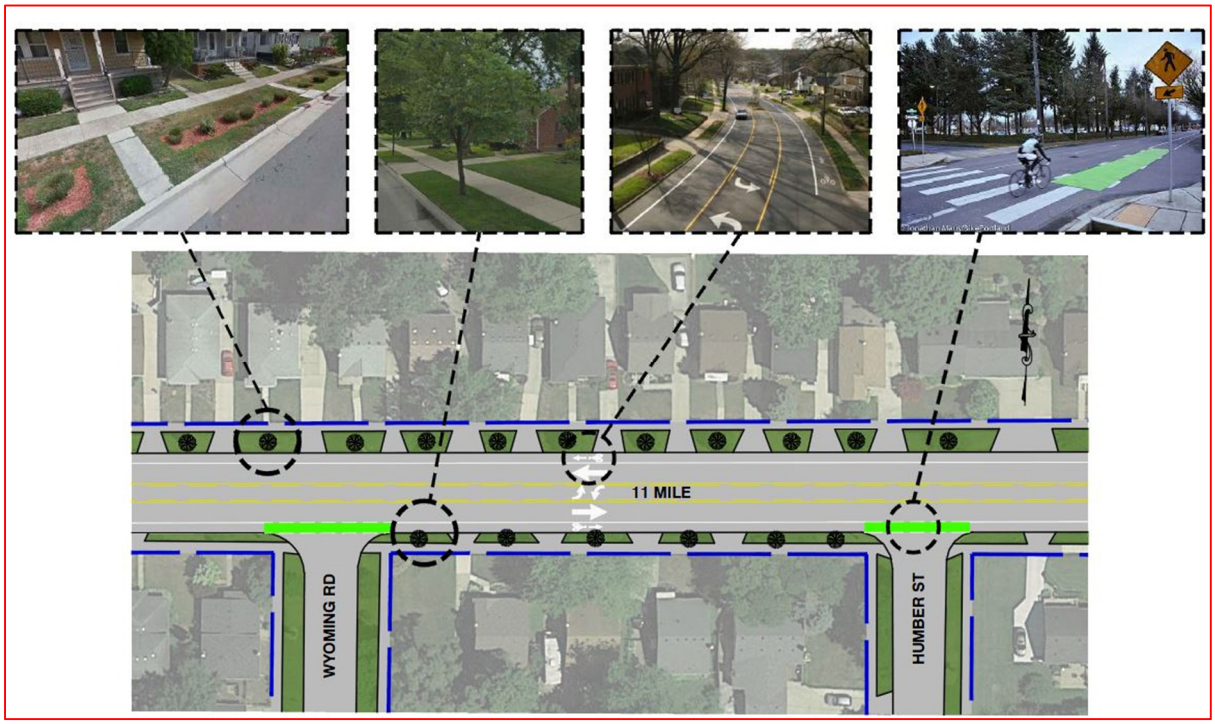
Eleven Mile Rd: Coolidge Hwy to Woodward Ave



This segment is primary residential and contains greenbelts along the road. Specific improvements should include:

- Additional street trees
- Bioswales at street intersections
- Greenbelt plantings in right of way (ROW)
- Enhanced crosswalks at:
  - Coolidge Hwy
  - Mortenson Blvd/Scotia Ave
  - Stanford Rd/ Meadowcrest Blvd
- Road diet
- On-street bike lanes; maintain sidewalks

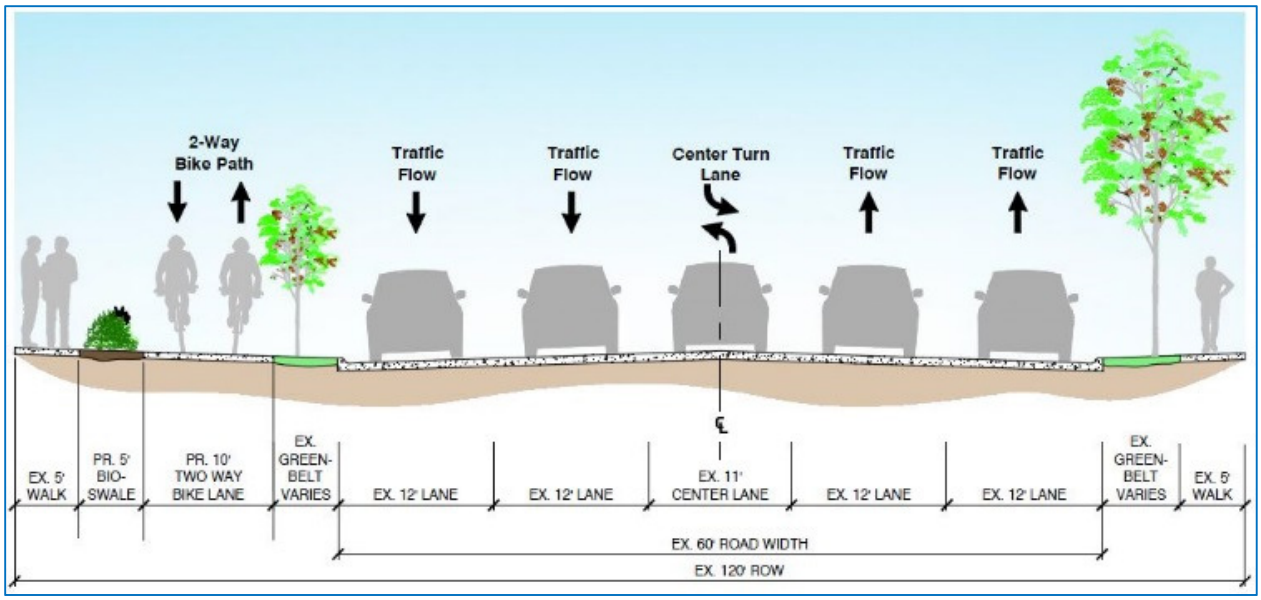
It is feasible to convert the existing 4-lane road into a 3-lane cross section, as shown here:



Some example locations include:

- Additional Street trees between the sidewalk and street in the 1600 block of Eleven Mile Rd
- Bioswale at the southwest corner of the intersection of Scotia Rd and Eleven Mile Rd
- Greenbelt planting in the ROW adjacent to Huntington Woods City Hall, along Eleven Mile Rd
- Replace concrete pavement in front of Huntington Woods City Hall with pervious pavement

Coolidge Hwy: Nine Mile Rd to Ten Mile Rd



This segment is primarily residential, with some commercial use. There are greenbelts along both sides of the road, with wider ROW along the west side of the roadway. Improvements to this corridor should include:

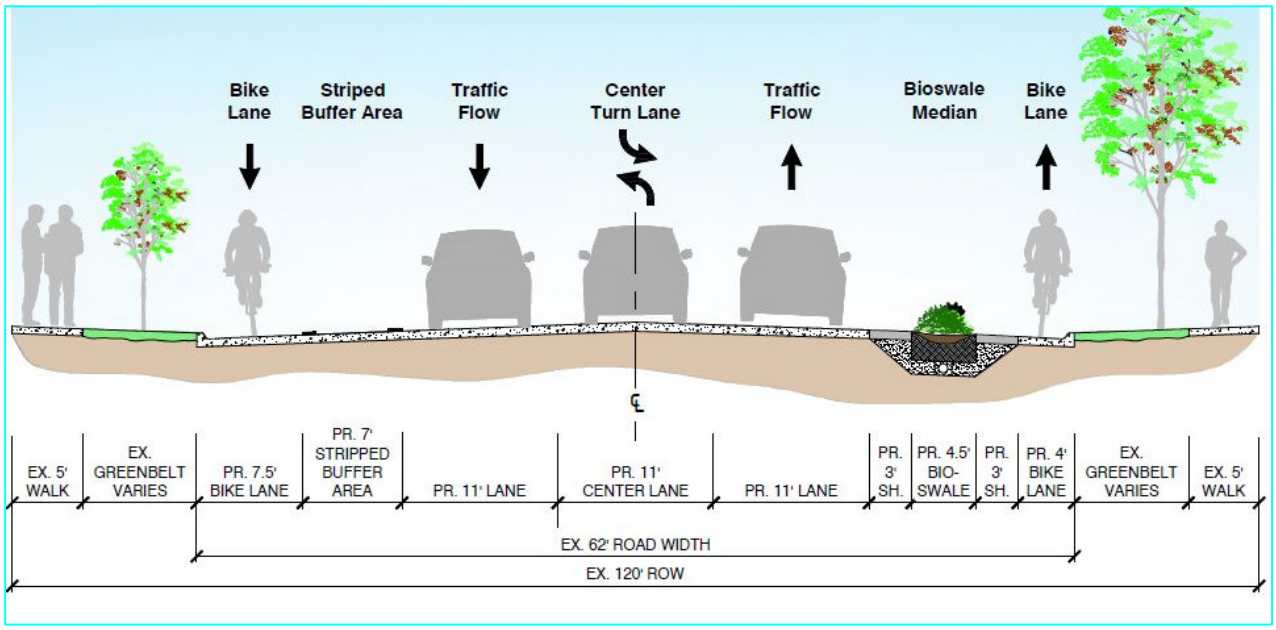
- Additional street trees
- Bioswales at street intersections
- Greenbelt plantings
- Enhance crosswalk at:
    - Oak Park Blvd
- Reduce lane widths
- Multi-use pathway along west ROW

A road diet is not feasible in this segment. To create better connectivity for bicyclists, a multi-use pathway should be constructed along the west ROW as illustrated in this plan view:

Some example locations include:

- Additional Street trees between the sidewalk and street in the 24000 block of Coolidge Hwy
- Bioswale at the intersection of Dartmouth St and Coolidge Hwy
- Plantings in the greenbelt in front of community buildings like churches and schools

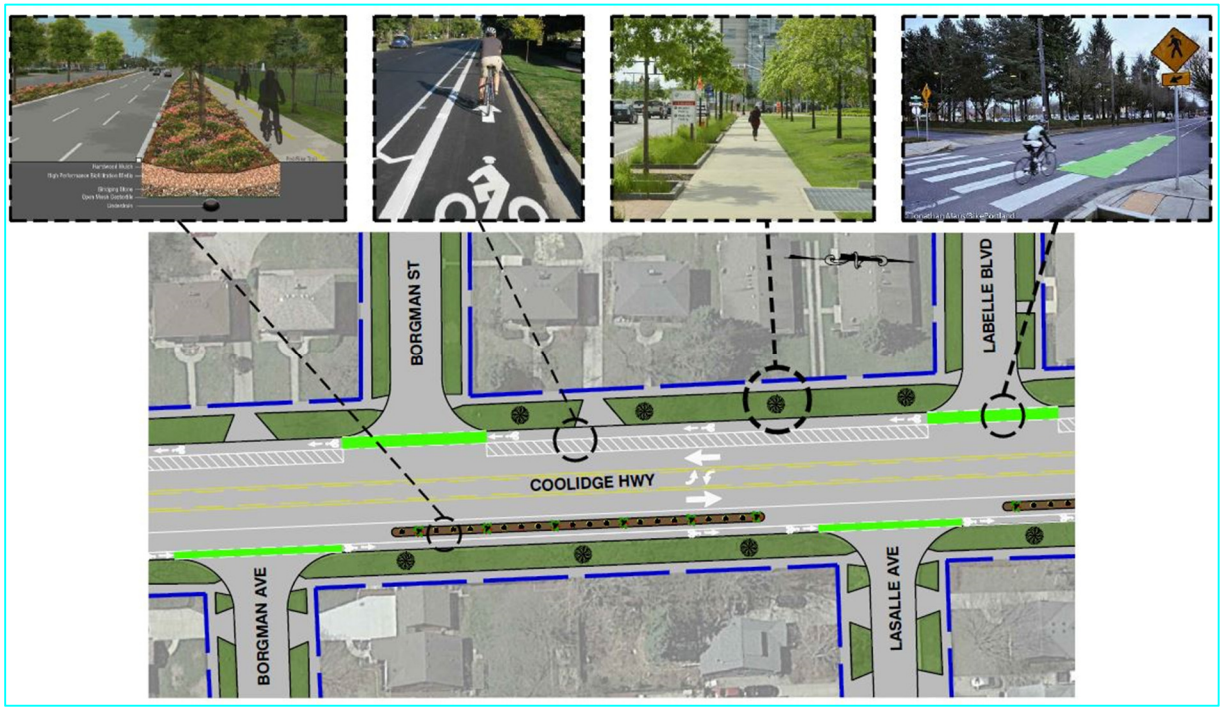
Coolidge Hwy: Ten Mile Rd to Eleven Mile Rd



This segment is primarily residential, with some commercial use. There are greenbelts along both sides of the road. The east side of the road has good access management, with few driveways. Improvements to this corridor should include:

- Additional street trees
- Linear Bioswales along the east side of the road, gapping out area for existing cross streets and driveways
- Bioswales at street intersections
- Greenbelt plantings
- Enhance crosswalks at:
  - Lincoln St/Dr
  - Eleven Mile Rd
- Road diet
- On-street bike lanes; maintain sidewalks
- Reducing pavement surface
- Signal Modernization at Lincoln St and Coolidge Hwy

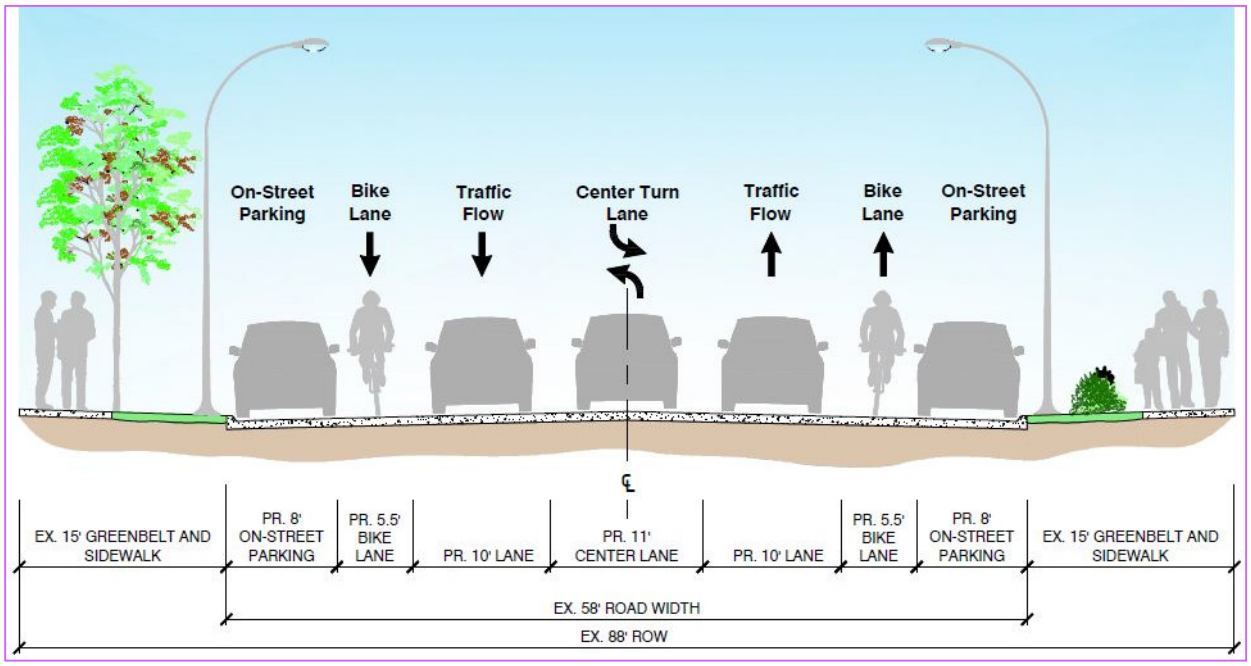
It is feasible to convert the existing 5 lane section into a 3 lane section as shown here:



Some example locations include:

- Additional Street trees between the sidewalk and street in the 26000 block of Coolidge Hwy
- Linear Bioswale along the east side of Coolidge Hwy between side streets
- Bioswale intersections on the west side of Coolidge like Talbot St
- Plantings in the greenbelt in front of community buildings like churches and schools

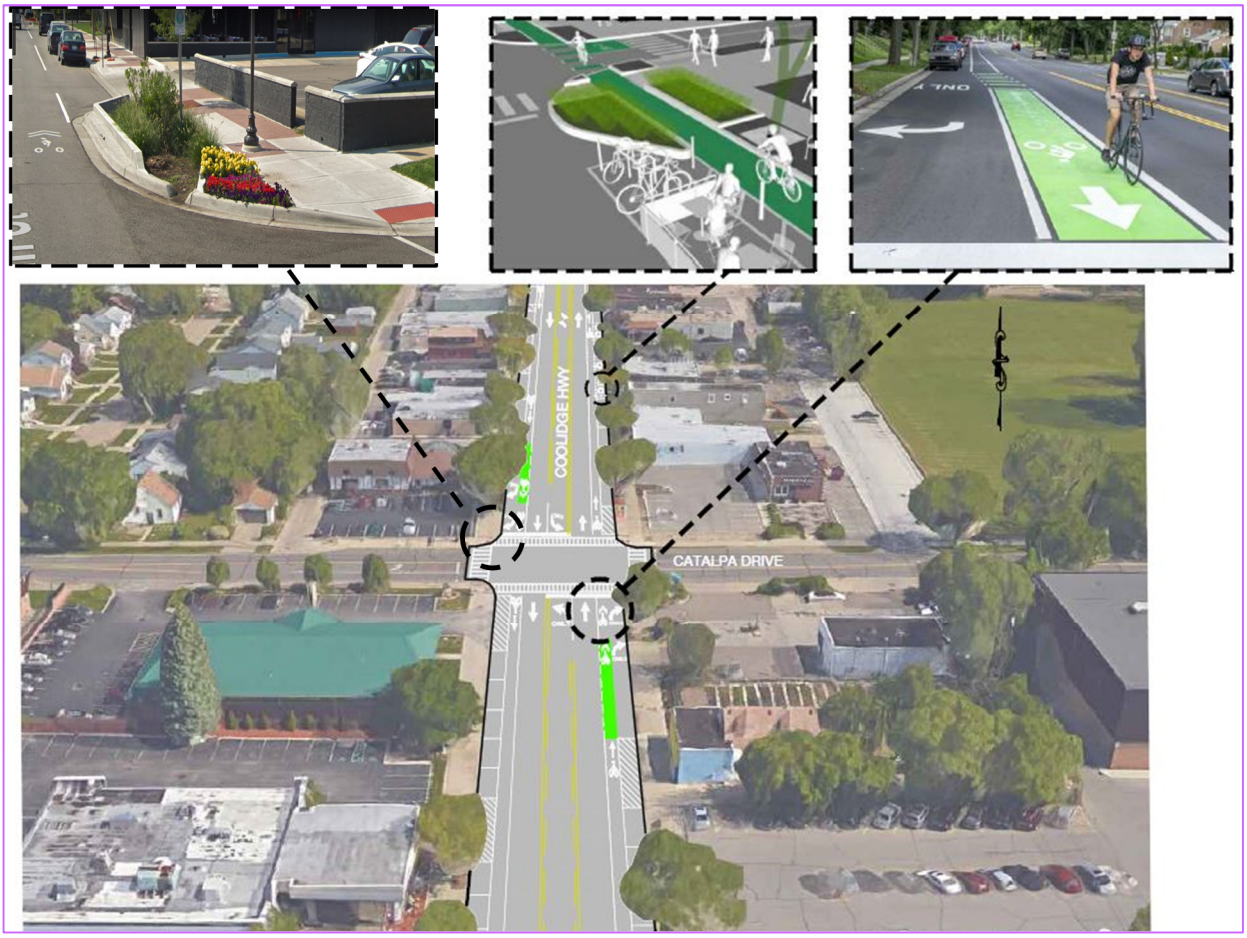
Coolidge Hwy: Eleven Mile Rd to Twelve Mile Rd



This segment is primarily commercial, and contains part of Downtown Berkley. There is existing on-street parking along both sides of the road. Improvements to this corridor may include:

- Additional Street Trees
- Greenbelt Plantings
- Bioswales at street intersections
- Murals or Public Art Displays
- Enhance crosswalks at:
    - Eleven Mile Rd
    - Harvard Rd
- Conversion of parking spaces into other uses (e.g. dining space, bicycle parking)

Implementation of a road diet was completed in 2019. The existing 4-lane road was converted into the following cross section:



Some example locations include:

- Additional Street trees between the sidewalk and street in the 2500 block of Coolidge Hwy
- Mural painted on brick exterior building similar to 3861 Twelve Mile Rd
- Bioswale at the intersection of Wiltshire Rd and Coolidge Hwy
- Plantings in the greenbelt in front of community buildings like churches and schools

IMPLEMENTATION

A phasing strategy is recommended for the implementation of improvements, based on short-term and long-term projects, funding opportunities, and areas of priority to the community.

Implementation Matrix - (S)hort term/(L)ong term)

		11 Mile Rd: Greenfield Rd to Coolidge Hwy	11 Mile Rd: Coolidge Hwy to Woodward Ave	Coolidge Hwy: 9 Mile Rd to 10 Mile Rd	Coolidge Hwy: 10 Mile Rd to 11 Mile Rd	Coolidge Hwy: Eleven Mile Rd to Twelve Mile	ESTIMATED UNIT COSTS
GREEN INFRASTRUCTURE							
	bioswales	S	S	S	S	S	$10 - $20 per square foot
	bioretention	L	L	L	L	L	$15 - $25 per square foot
	vegetated swales	L	L	L	L	L	$5 - $15 per square foot
	tree planting (w/ pits)	S	S	S	S	S	$5K - $10K ea
	sidewalk gardens	S	S	S	S	S	$0.25 - $10 per square foot
	pervious pavement	S	L	L	L	L	$5 - $20 per square foot
	greenbelt planting		S	S	S	S	$0.25 - $10 per square foot
LANE MODIFICATIONS							
	road diet	S	S		S	S	$15K - $40K per lane mile
	on-street parking					S	$5K - $15K per lane mile
	reduced lane width	S	S	S	S	S	$5K - $15K per lane mile
	reduce pavement footprint	L	L		L	L	$1M - 1.5M per lane mile
	repurpose use of ROW				S	S	$0.25 - $10 per square foot
	bike lanes				S	S	$5K - $15K per lane mile
	multi-use path			L			$5 - $15 per square foot
NON-MOTORIZED ACCESS/CONNECTIVITY							
	enhanced markings	S	S	S	S	S	$10K - $50K per lane mile
	ADA upgrades	S	S	S	S	S	$10 - $20 per square foot
	lighting	S	S	S	S	S	$5K - $10K ea
	signage	S	S	S	S	S	$5K to $35K per lane mile
	ped. channelization	S	S	S	S	S	$5 - $40K ea
	signal modernization	L			L		$150K - $400k ea
	ped. actuated conspicuity devices	S	S	S	S	S	$10K - $30K ea

FUNDING OPPORTUNITIES

There are many grants from government agencies, private companies, and non-profit organizations that focus of green infrastructure, improved bike and pedestrian connectivity, and the reduction of storm water runoff. Potential funding opportunities include (but are not limited to):

- MAP-21: Transportation Alternatives Program and Safe Routes to Schools
- Michigan Transportation Fund
- Congestion Mitigation/Air Quality
- Michigan Nature Resources Trust Fund
- Land and Water Conservation Fund
- Advocacy Advance Rapid Response Grant
- DALMAC Fund
- PeopleForBikes Community Grant Program
- Small Grant Programs
- TAP Grant
- Greenway Grants
- NFWF Resilience Grants
- SEMCOG Grants
- Corporate partnerships and sponsorships

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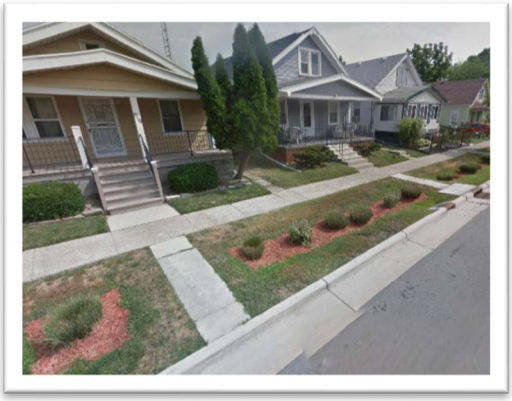
Green Infrastructure Glossary

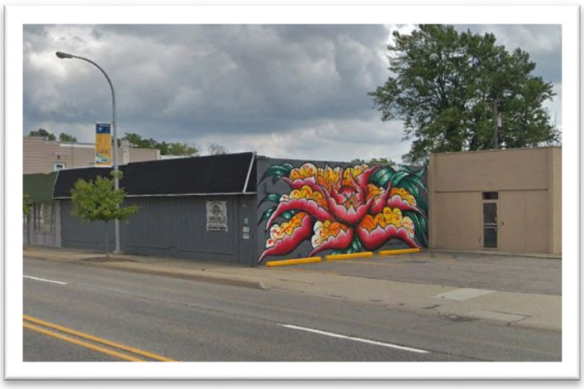
- **Bioretention:** Landscaped depressions or shallow basins used to slow and filter and hold storm water runoff. Water enters the basin, and slowly filters through the engineered subbase, removing sediment and pollutants as it infiltrates. Water either stays in the basin, or is infiltrated into the surrounding soil.


- **Bioswales:** Landscaped depressions or swales that are used to pretreat storm water before it enters the storm sewer system. Storm water enters the swale and slowly infiltrates into the engineered subbase, which helps to remove sediment and pollutants. The water is then sent into the existing storm sewer system or suitable outlet.

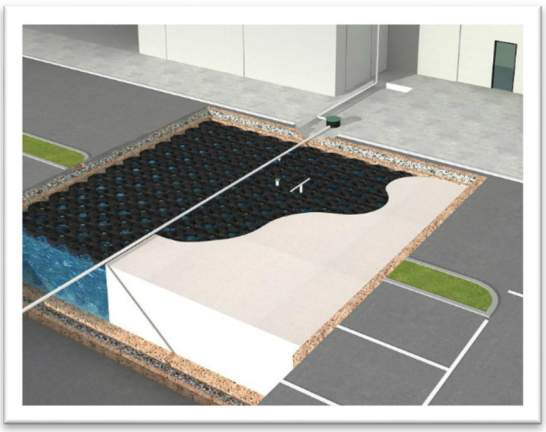

- **Greenbelt plantings in ROW:** Plants placed between the sidewalk and street to improve water infiltration, reduce jay walking, and beautify the corridor



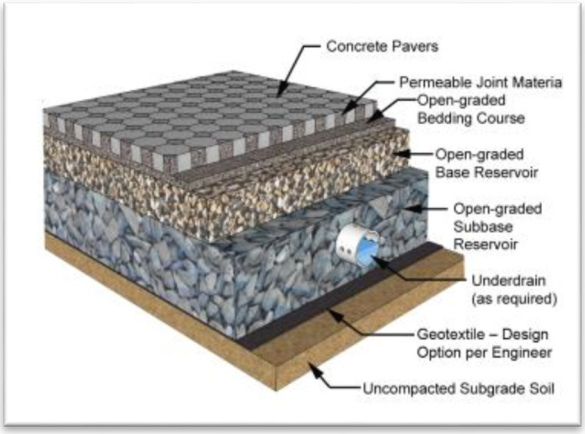

- **Murals or public art displays:** Placement of artwork in strategic locations including murals painted on bare cinderblock or brick walls of commercial buildings



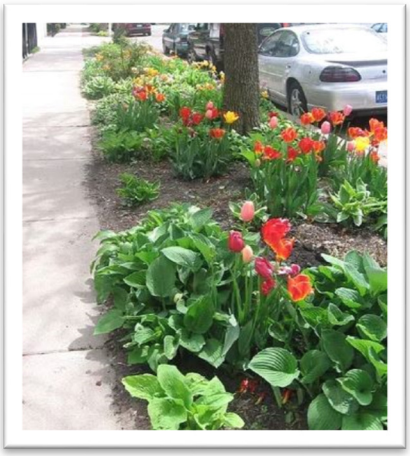
- **Pervious Pavement:** Pavement with a high porosity that allows water to pass through the pavement into an engineered subbase or drainable subgrade below. This will trap suspended solids and pollutants in the subbase, preventing these contaminants from entering the storm water sewer system.



- **Pervious Pavers:** Paver blocks made of pervious pavement. This allows water to drain through the pavement into an engineered subbase or naturally drainable subgrade.



- **Sidewalk Gardens:** Garden beds placed between the sidewalk and the road to promote community gardens and prevent jaywalking



- **Street trees:** Trees of appropriate species are planted in paved areas using special tree grates and underground cells, with irrigation inlets to allow the trees to thrive.


- **Vegetated Swales:** Landscaped swales that are used to slow down the flow of storm water before it enters the storm sewer system or suitable outlet.


Coolidge – 10 Mile to 9 Mile Road Diet

City of Oak Park

9/7/2018

Cawley, Patrick (TIA)

Contents

Coolidge – 10 Mile to 9 Mile Road Diet

City of Oak Park

Introduction

The Cities of Huntington Woods, Oak Park and Berkley have requested the Transportation Improvement Association (TIA) conduct a corridor study for Coolidge Highway Road between 10 Mile Road and 9 Mile Road. The objective of the study is to assess the feasibility of reducing the cross section of Coolidge Highway to a three (3) lane cross section. The scope of the study includes evaluating the current and proposed traffic operations for the five (5) signalized intersections in the corridor. Additionally, the crash history of the corridor and the access point density will be examined.

Existing Geometry

The corridor currently has a five (5) lane cross section with auxiliary right turn lanes at the 10 Mile Road and 9 Mile Road signalized intersections. The basic width of the section is approximately 59 feet with five (5) lanes at 11' to 12.5' each. A two way center lane exists in the corridor and no on street parking is present.

Signalized intersections are present at 10 Mile Road, Parkwood Plaza Shopping center (AM flash operation), Oak Park Boulevard, McClain Drive and 9 Mile Road. The posted speed limit is 35 mph through the corridor.

Access point density or driveway density measures the total number of access points onto the roadway, driveways and intersections, for a segment. It is a good measure of the suitability of a center turn lane. The number of access points for corridor segments are illustrated in Table 1. All the segments average more than 30 access points per mile, ranging from 48 per mile to 104 per mile. This is considered high for an arterial roadway.

Table 1 Access Point Density

Segment	Length (miles)	Number of Access Points
10 Mile to Parkwoods Plaza Shopping Ctr	0.11	6
Parkwoods Plaza Shopping Ctr to Oak Park Blvd	0.49	51
Oak Park Blvd to McClain Dr	0.23	11
McClain Dr to 9 Mile	0.14	7

Crash History

The three year crash history (2015-2017) was examined for the corridor. The crash history was compiled for the intersections / segments in the corridor. The results are shown in Table 2.

Table 2 Crash Frequencies

Segment / Intersection	Total Crashes	Injury Crashes	PDO Crashes	Rear-End
10 Mile to Burton	36	4	32	16
Burton to Oak Park	18	5	13	11
Oak Park Blvd Intersection	34	8	26	22
Oak Park Blvd to McClain Dr	20	2	18	10
McClain intersection	11	1	10	8
Mclain to 9 Mile	2	0	2	0
9 Mile intersection	63	14	49	23

Within the study limits, a total 184 crashes occurred. Injury crashes totaled 34 and property damage only (PDO) crashes were 150. Rear end crashes were approximately 50% of the total. One (1) pedestrian crash occurred, where three pedestrians were struck by a vehicle entering the roadway into the center turn lane.

As the corridor includes a continuous center turn lane, there is no expectation of reduced crashes. Rear end crashes may increase due to right turn maneuvers and stopping / slowing in the consolidated through lane.

Existing Traffic Operations

For the study both manual peak hour turning movement counts and 24 hour automatic counts were collected. Figure 1 contains the daily traffic volumes and Figure 2 illustrates the peak hour counts at the major intersections. The average daily traffic was between 24,000 and 28,000 vehicles per day. The high hour directional volume was greater than 1,000 vehicles. Both these values are above typical thresholds for consideration of a road diet (4 to 3 conversion).

Using the existing traffic volumes and the current signal timings, a capacity analysis was performed using Synchro software. The corridor was modeled as a network from 10 Mile Road to 9 Mile Road. Based on the *Highway Capacity Manual* methodologies the level of service (LOS) was generated. Table 3 illustrates the levels of service definitions per the HCM.

Table 3 Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (secs/veh)	General Description
A	0-10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

The summary of the analysis is contained in Table 4. The complete Synchro reports are contained in Appendix B.

Table 4 Intersection Level of Service- Existing Conditions

Intersection	AM Peak Level of Service	PM Peak Level of Service
Coolidge / 10 Mile	B	B
Coolidge / Parkwoods Plaza Oaks Shopping Ctr	A**	B
Coolidge / Oak Park Blvd	D	A
Coolidge / McClain	D	C
Coolidge / 9 Mile	D	D

**Flash operation

The arterial level of service was also examined for the corridor. Arterial level of service measures the mean travel speed through the corridor including traffic signal delay and equates the performance based on the character of the corridor. In the AM peak period the reported levels were an LOS D / E for northbound / southbound respectively. In the PM peak it was LOS C / E for northbound / southbound respectively.

Existing Traffic with Proposed Geometry

As the comparison of existing traffic with the 3 lane cross section is relevant to measure the impact of any such changes, Synchro was again utilized to assess level of service. The existing traffic volumes were tested with the proposed geometry and the signal timing splits optimized by the software for each intersection (with current cycle length and progression). The approach laneage was keep the same for the 10 Mile intersection and the northbound 9 Mile intersection, with assumed transition occurring approximately 700 feet south of 10 Mile near Burton Street. The three (3) lane section was carried through the corridor and the through-right lanes were converted to right only lanes.

Table 6 summarizes the intersection level of services. There are some decreases in level of services, particularly the Oak Park and McClain intersections, which would operate with LOS D/ F with reductions in the geometry for the northbound and southbound approaches.

Table 6 Intersection Level of Service- Projected Geometry-Existing Traffic

Intersection	AM Peak Level of Service	PM Peak Level of Service
Coolidge / 10 Mile	B	B
Coolidge / Parkwoods Plaza Oaks Shopping Ctr	A**	C
Coolidge / Oak Park Blvd	F	D
Coolidge / McClain	F	F
Coolidge / 9 Mile	F	F

**Flash operation

The proposed 3 lane geometry is appeared to have significant impacts. Additional modeling was performed with changes to the cycle lengths and removing progression within the corridor (independent cycle lengths). With this changes the expected level of service would be LOS D. The performance would be less than the existing conditions, and affect through travel.

The arterial level of service was again examined, with unacceptable impacts to the corridor. In the AM peak period the reported levels were an LOS F / F for northbound / southbound respectively. In the PM peak it was LOS F / F for northbound / southbound respectively.

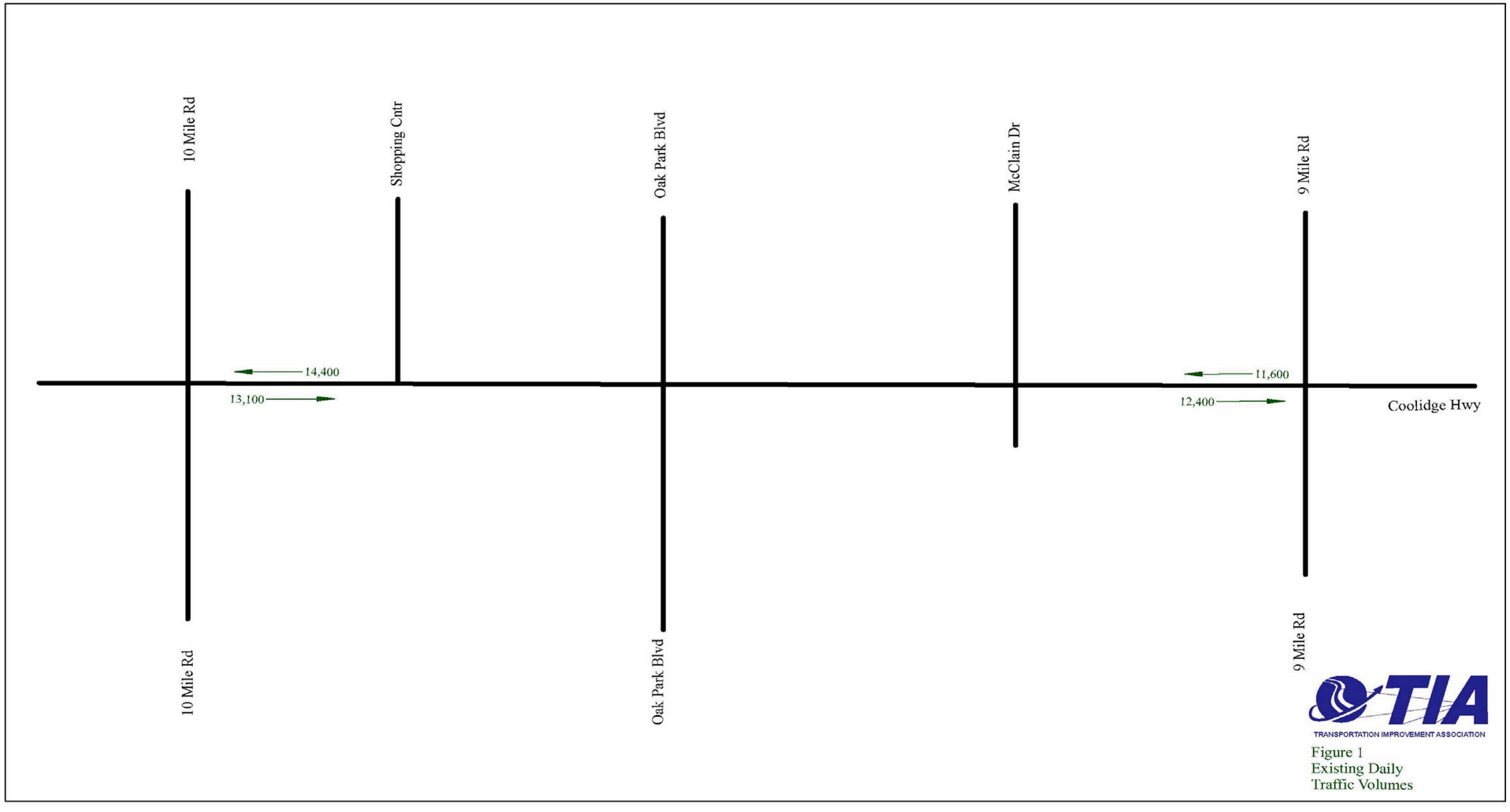
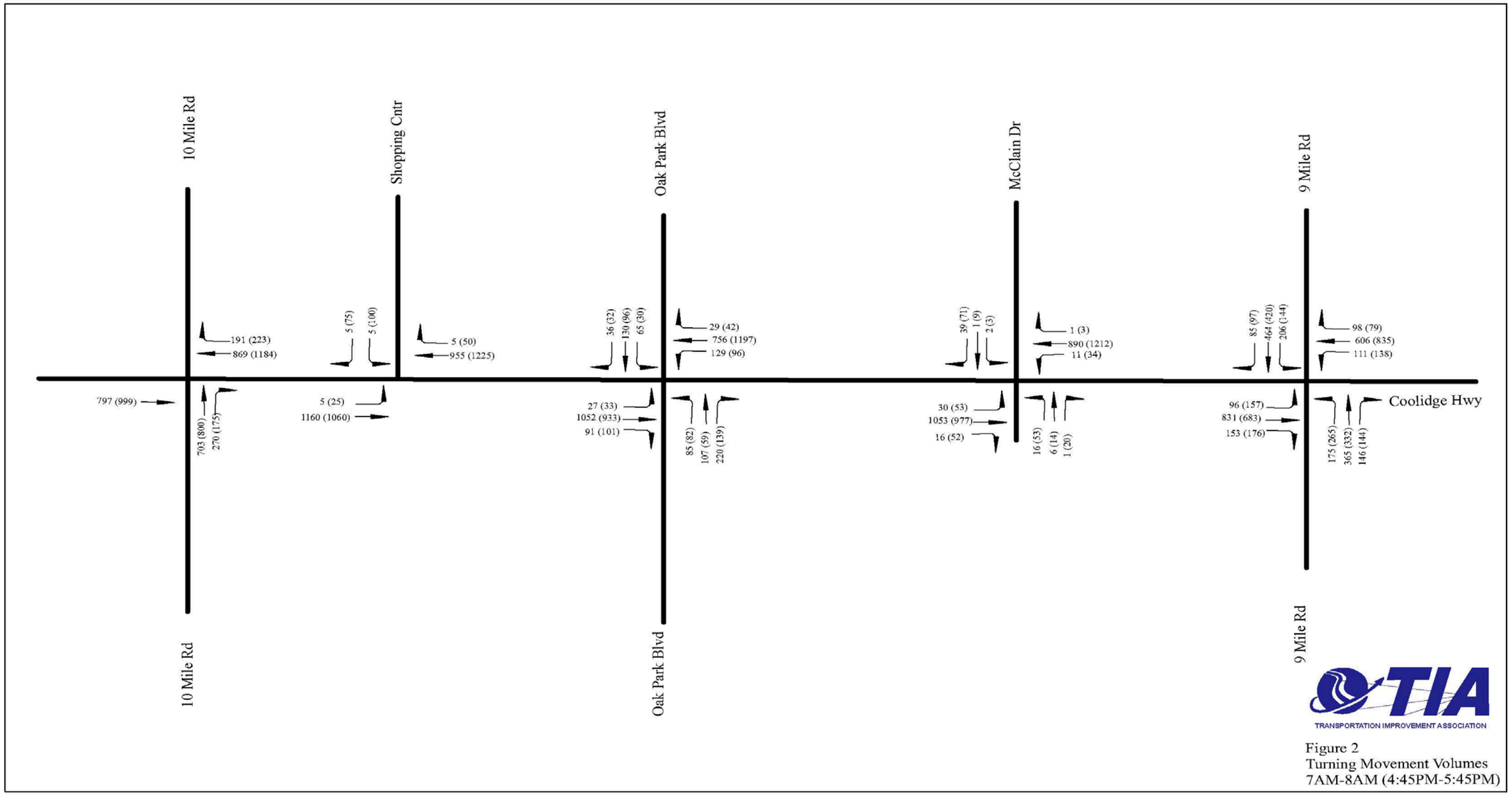


Figure 1
Existing Daily
Traffic Volumes



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 2
Turning Movement Volumes
7AM-8AM (4:45PM-5:45PM)

Projected Traffic Conditions (2023)

The proposed improvements will consist of pavement marking modifications and as such they will have a service life of 5 years or less. Based on this a horizon year of 2023 was chosen for the projected condition.

The assumed geometry was a three (3) lane cross section in place starting just south of Burton and ending at 9 Mile Road. The 10 Mile Road geometry was keep the same

SEMCOG projections used in earlier corridor studies, indicate a net decrease in traffic volumes in the corridor. In order to perform a conservative analysis an assumption that some short term growth will occur. In this case a growth rate of 1.0% per year was applied to the existing volumes. The 2023 daily volumes are shown in Figure 3 and projected 2023 turning movement volumes are shown in Figure 4.

A capacity analysis was again performed using Synchro software based on the 2023 volumes and with optimized traffic signal timings. Coordination dropped within the corridor, with 130 second cycles used at Oak Park Boulevard, McClain Drive and 9 Mile Road. The cycle lengths at 10 Mile and the Shopping Center were retained as 100 second cycles. The expected level of service was calculated and a summary of the analysis is contained in Table 7.

Table 7 Intersection Level of Service- 2023 Projected Geometry / Traffic

Intersection	AM Peak Level of Service	PM Peak Level of Service
Coolidge / 10 Mile	C	C
Coolidge / Parkwoods Plaza Oaks Shopping Ctr	D**	D
Coolidge / Oak Park Blvd	D	C
Coolidge / McClain	B	C
Coolidge / 9 Mile	E	E

**Flash operation

In the 2023 horizon year there is some degradation of level of service as shown above. The AM peak hour level of service at Oak Park Boulevard is expected to be a LOS D and the PM peak at the shopping plaza is LOS D. Level of service D is deemed an adequate level in most urbanized areas. At the 9 Mile Road intersection the level of service E is experienced during both peak and is generally not acceptable.

The corridor level of service is expected to be at LOS C /E for the Am peak period for the northbound / southbound directions. The PM peak period is expected to perform at LOS C /D for the northbound/ southbound respectively.

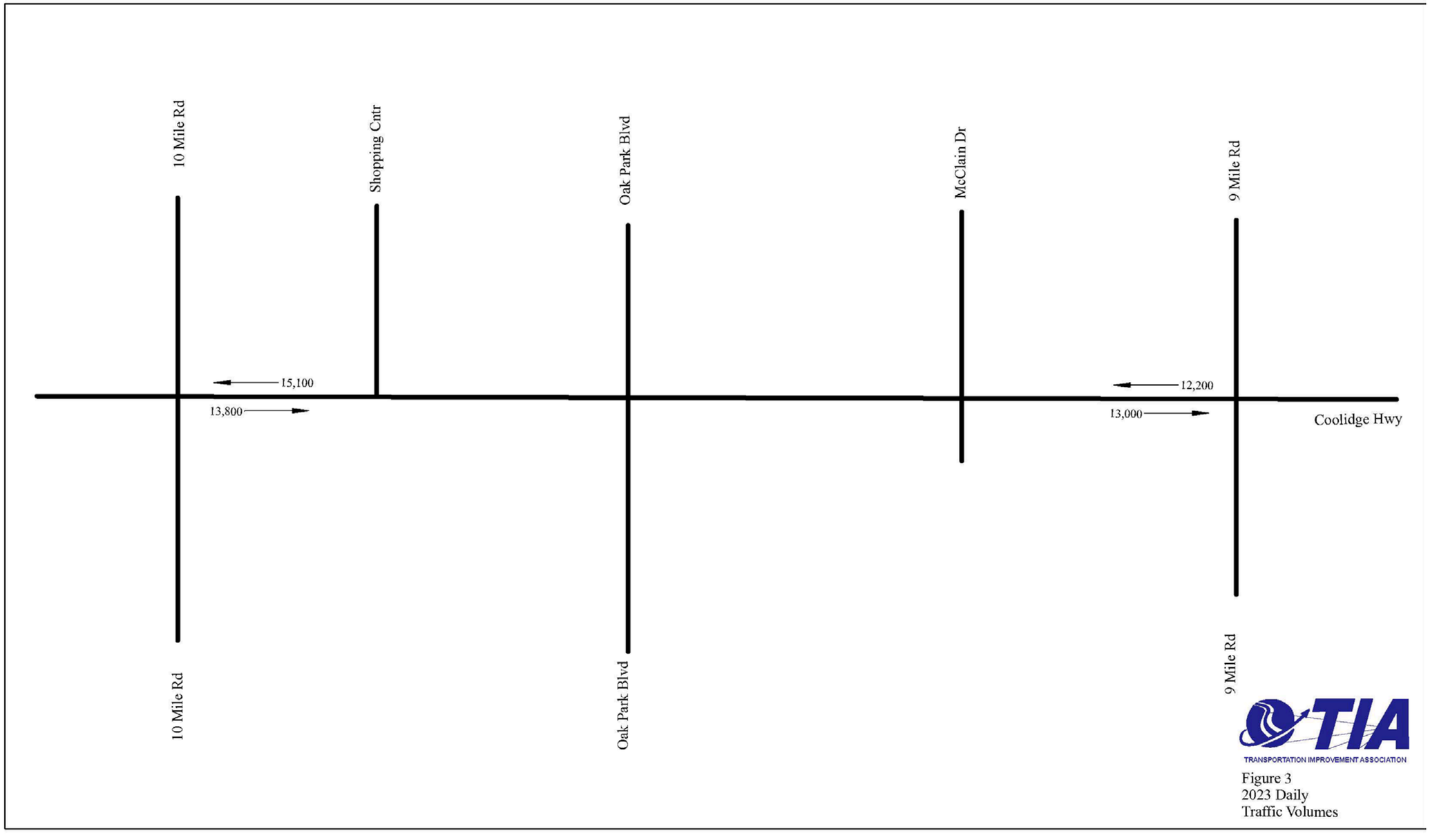
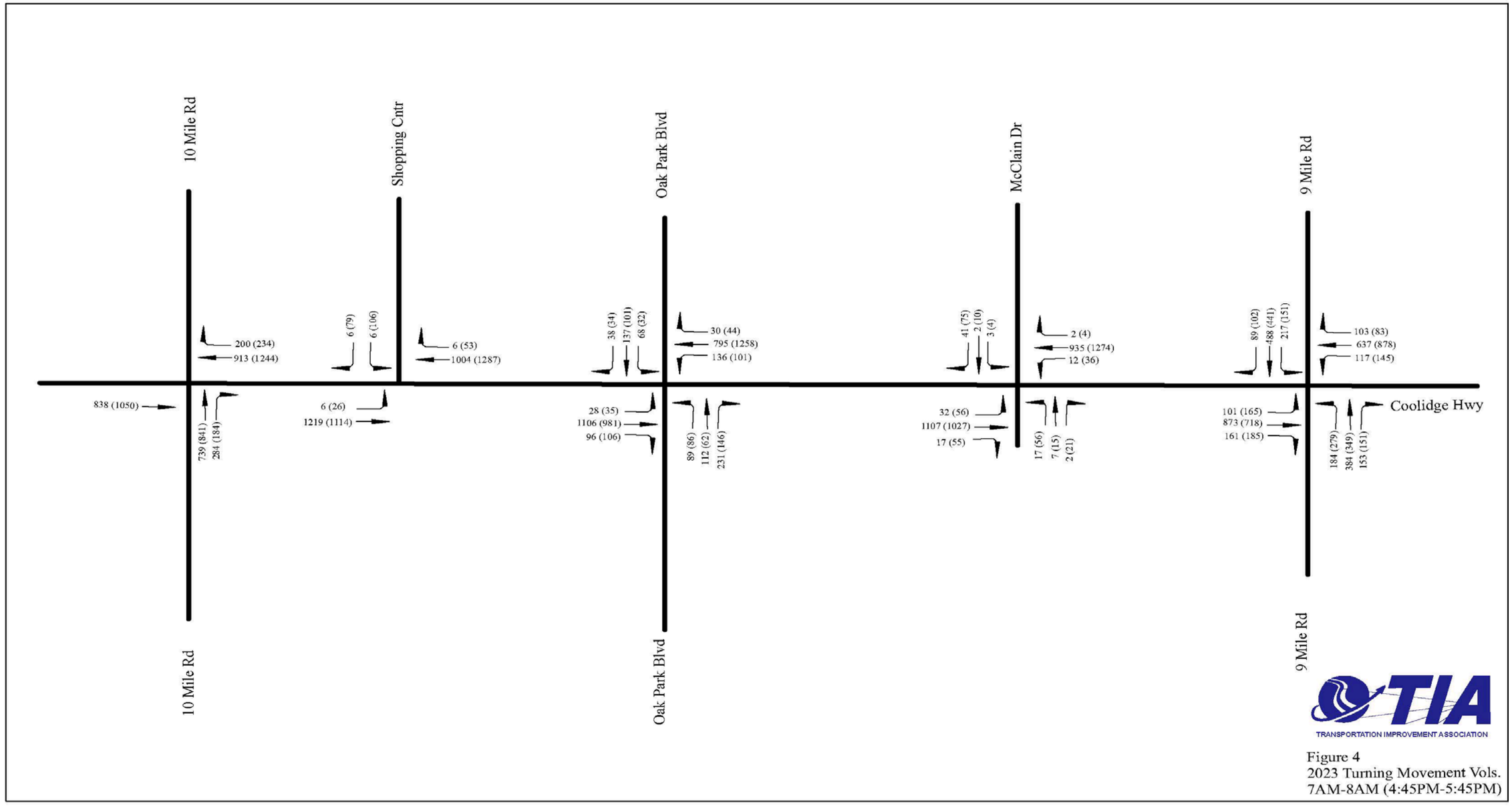


Figure 3
2023 Daily
Traffic Volumes



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 4
2023 Turning Movement Vols.
7AM-8AM (4:45PM-5:45PM)

Conclusions and Recommendations

Based on the analysis of the existing and future traffic operations, the reconfiguration of the roadway to three (3) lanes would have negative impacts. In order to achieve acceptable levels of service the corridor would need to be run in an uncoordinated fashion, with long cycle lengths at the south end.

The implementation of a three (3) lane cross section will not reduce crashes within the corridor, as is typical with a four (4) lane cross section. Due to the reduction of through lanes and the conflicts introduced for right turn movements, an increase in rear end crashes could be expected.

The future year 2023 traffic, which conservatively assumes some level of background growth can operate at acceptable levels of service with the exception 9 Mile Road intersection. Additionally, the Oak Park Boulevard intersection may be borderline inadequate at LOS D. This will require different signal cycle lengths and operation in an uncoordinated fashion.

The recommendations are as follows:

- Retain the existing five (5) lane cross-section as the basic geometry.
- One option is to restripe the roadway with narrower lanes, such as 11 feet travel lanes and a 10 feet center turn lane. Provide a bike lane for one direction with the repurposed five (5) feet.
- Alternately the roadway could be restriped to provide a wider (14') curb lane and marked with "sharrows" to denote the shared use.

Appendix A

Traffic Volume Data

Appendix B

Synchro Reports

Appendix C

Traffic Crash Data

Coolidge Highway – Road Diet

City of Berkley

6/29/2018

Cawley, Patrick (TIA)

Contents

Coolidge Highway – Road Diet

City of Berkley

Introduction

The City of the Berkley and the Downtown Development Authority requested the Transportation Improvement Association (TIA) conduct a corridor study for Coolidge Highway between 10 Mile Road and 12 Mile Road. The study is to assess the feasibility of reducing the cross section of Coolidge Highway to a three (3) lane cross section. The scope of the study includes evaluating the current and proposed traffic operations for the seven (7) signalized intersection in the corridor. Additionally, the crash history of the corridor and the access point density will be examined.

Existing Geometry

The corridor is a five (5) lane section between 10 Mile and 11 Mile with a center turn lane and two (2) travel lanes in each direction. The width is approximately 61 feet with an eleven feet (11') turn lane and twelve feet to thirteen feet (12'-13') wide travel lanes. No on street parking exists in this section.

Between 11 Mile Road and 12 Mile Road the cross section is a four (4) lane section, two travel lanes in each direction and intermittent on street parking. The basic width is 58 feet, with four (4) eleven feet (11') travel lanes and a seven (7) feet parking lane. At the signalized intersections a center turn lane is developed.

Access point density or driveway density measures the total number of access points onto the roadway, driveways and intersections, for a segment. It is a good measure of the suitability of a center turn lane. The number of access points for corridor segments are illustrated in Table 1. All the segments average more than 30 access points per mile, which would be considered high for an arterial roadway.

Table 1 Access Point Density

Segment	Length (miles)	Number of Access Points
10 Mile Rd (I-696) to Lincoln Dr	0.45	34
Lincoln Dr to 11 Mile Rd	0.50	28
11 Mile Rd to Havard Rd	0.22	20
Havard Rd to Catalpa Dr	0.28	23
Catalpa Dr to Wiltshire Dr	0.18	13
Wiltshire Dr to 12 Mile Rd	0.32	27

Crash History

The three year crash history (2014-2016) was examined for the corridor. In order to evaluate the proposed geometry the signalized intersections, which include left lanes, were excluded from the summary. The results are shown in Table 2.

Table 2 Crash Frequencies

Segment	Total Crashes	Injury Crashes	PDO Crashes	Mitigated by Turn Lane*
10 Mile to Lincoln	11	2	9	N/A
Lincoln to 11 Mile	15	4	11	N/A
11 Mile to Havard	15	3	12	13
Havard to Catalpa	16	6	10	10
Catalpa to Wiltshire	10	1	9	8
Wiltshire to 12 Mile	13	1	12	11
Corridor Complete	**80**	**17**	**63**	**42**

*Sideswipe same, rear end, rear end /left and head on /left type crashes.

North of 11 Mile Road, in the 4 lane areas, eight (8) side-swipe same type crashes occurred. These are due to lane changes or collisions with parked vehicles. Additionally, 20 rear-end crashes occurred outside of the signalized intersections. These are typically the result of vehicle stopping or slowing to turn and can be mitigated by the addition of center turn lane.

The conversion of a 4 lane roadway to a 3 lane roadway with center turn lane has been shown to reduce crashes. The expected decrease in crashes would be 29% of all crashes (in the existing 4 lane section).

Existing Traffic Operations

For the study both manual peak hour turning movement counts and 24 hour automatic counts were collected. Figure 1 contains the daily traffic volumes and Figure 2 illustrates the peak hour counts at the major intersections.

Using the existing traffic volumes and the current signal timings, a capacity analysis was performed using Synchro software. The corridor was modeled as a network from 10 Mile to 12 Mile. Based on the *Highway Capacity Manual* methodologies the level of service (LOS) was generated. Table 1 illustrates the levels of service definitions per the

Table 3 Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (secs/veh)	General Description
A	0-10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

The summary of the analysis is contained in Table 2. The complete Synchro reports are contained in Appendix B.

Table 4 Intersection Level of Service- Existing Conditions

Intersection	AM Peak Level of Service	PM Peak Level of Service
10 Mile / Coolidge	B	C
Lincoln / Coolidge	B	A
11 Mile / Coolidge	C	B
Havard / Coolidge	A	A
Catalpa/ Coolidge	B	A
Wiltshire / Coolidge	B	B
12 Mile / Coolidge	D	D

Travel time runs were conducted along the corridor to measure the existing time it takes to travel between 10 Mile and 12 Mile. The runs occurred during the AM and PM peak hours. The results are contained in Table 5. The travel times are important to collect prior to any changes; as post implementation it is a key measure to evaluate.

Table 5 Travel Time Runs- average time

Segment	AM Peak	PM Peak
NB – 10 Mile to 12 Mile	5'46"	5'34"
SB – 10 Mile to 12 Mile	5'35"	5'-1"

Using the average travel times per direction and the length of the corridor this equates to an average speed northbound of 21 miles per hour in the AM period and 21 miles per hour in the PM peak. The southbound average speeds were 21 mph and 23 mph respectively.

The Synchro model was also used to estimate arterial speed and arterial level of service for Coolidge Highway. The simulation report had an average speeds of 23.6 mph for northbound and 25.8 mph for southbound in the AM peak (slightly optimistic over observed). This equates to an arterial level of service of C/B for northbound / southbound respectively. The PM peak period had average speeds of 25.1 mph and 26.1 mph, with corresponding level of service B /B, respectively. Again slightly above what was measured in the field.

Existing Traffic with Proposed Geometry

As the comparison of existing traffic with the 3 lane cross section is relevant to measure the impact of any such changes, Synchro was again utilized to assess level of service. Table 6 summarizes the intersection level of services. There are some decreases in level of services, but still acceptable levels are provided. Arterial level of service remained in the B/C range with arterial speeds of 21.8 to 24.0 mph predicted.

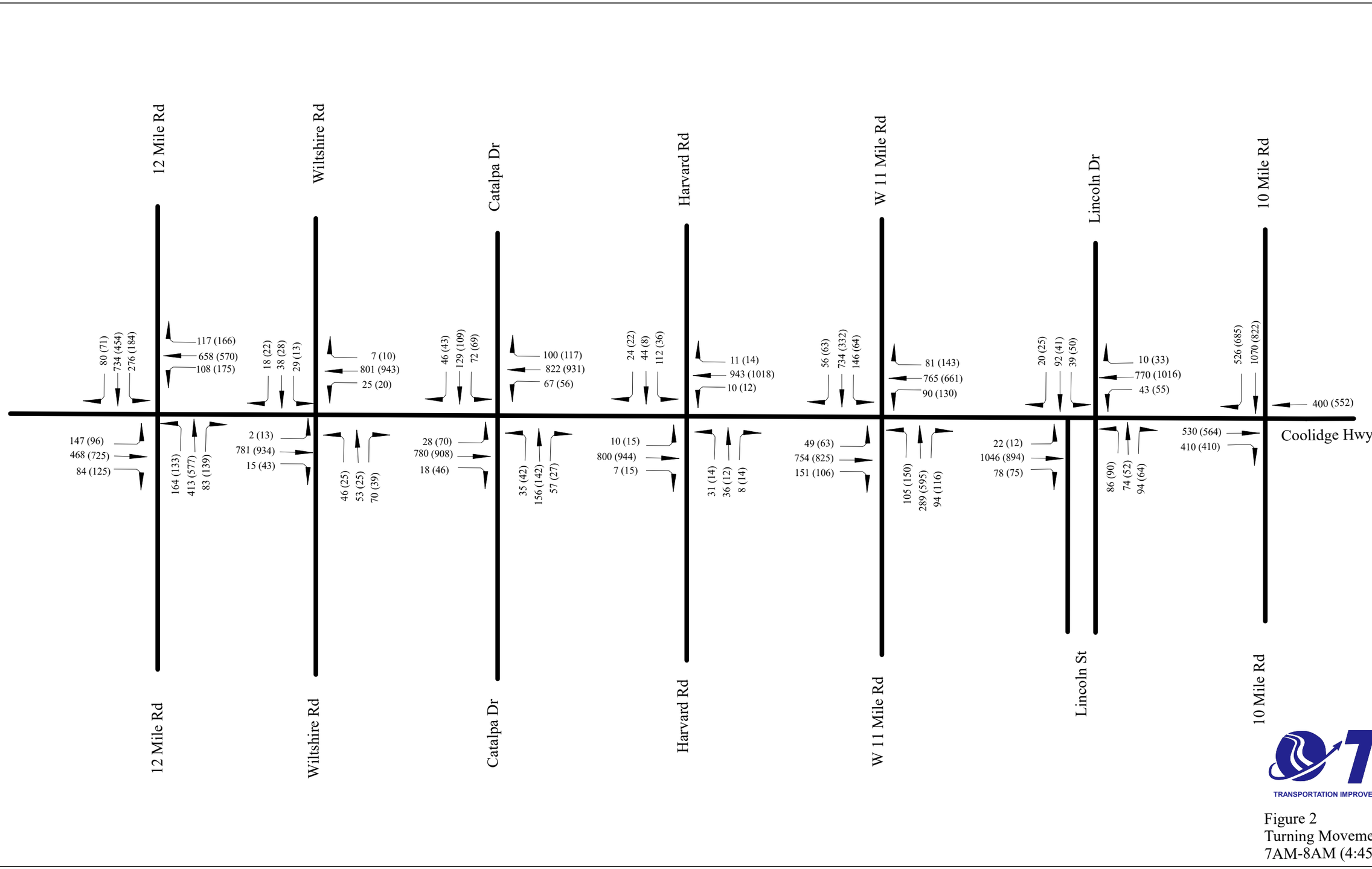
Table 6 Intersection Level of Service- Projected Geometry-Existing Traffic

Intersection	AM Peak Level of Service	PM Peak Level of Service
10 Mile / Coolidge	B	C
Lincoln / Coolidge	B	B
11 Mile / Coolidge	C	C
Havard / Coolidge	B	B
Catalpa/ Coolidge	B	B
Wiltshire / Coolidge	C	D
12 Mile / Coolidge	D	D

Based on the summary of level of service it appears the proposed geometry is feasible and would have minimal operational impact.

TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 1
Existing Daily
Traffic Volumes



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 2
Turning Movement Volumes
7AM-8AM (4:45PM-5:45PM)

Planned Development

Based on current plans submitted to the City that are in the development / plan review process two (2) new developments are expected to impact the corridor. These include the following:

- La Salette School Property Development
- Harvard Commons Condominiums (under construction)

The current proposed development on the La Salette site calls for 130 apartment units and 8 condo units. Based on the traffic impact study prepared for the La Salette project a total of 87 new trips in the AM peak and 112 in the PM peak period. Harvard Commons is a 15 unit condominium development that is constructed and has units in various states of being occupied. For this study the traffic for Harvard Commons was considered to be in the existing volumes.

SEMCOG Travel Demand Modeling

The City requested that the Southeast Michigan Council of Governments (SEMCOG) perform modeling of the impact to the network if the geometry of Coolidge Highway is reduced. SEMCOG provided models for the existing condition, the 2040 with existing network and the 2040 with proposed changes.

Based on the macroscopic travel demand model traffic is expected to shift to adjacent north-south roadways. The 2040 no build condition compared to the proposed geometry predicts a 30-37% decrease in daily traffic volumes on Coolidge Highway. This will lead to a 6-10% increase on Greenfield Road and 2-7% increase on Woodward Avenue. A macroscopic model relies on a rough approximations of the roadway link capacity and in this case it appears to overestimate the amount of diversion. In a signalized roadway network the intersection performance will drive the throughput of the corridor. To assess this involves the micro level analysis, such as contained within the report and this is likely not reflected in the SEMCOG modeling.

The other aspect of the SEMCOG modeling is the expected growth of traffic within the corridor. Based on the comparison of existing traffic to 2040 traffic, it is predicted to have a net decrease in traffic volumes.

Projected Traffic Conditions (2023)

The proposed improvements primarily consist of pavement marking modifications. As such they will have a service life of 5 years or less. Based on this a horizon year of 2023 was chosen for the

projected condition. The north end of the project is assumed to be just south of Beverly Boulevard. At signalized intersections the within the corridor, the right most lane which is a right –through lane was converted to right only operation.

As stated earlier the SEMCOG projections show a net decrease in traffic volumes over time. In order to perform a conservative analysis an assumption that some short term growth will occur. In this case a growth rate of 1.0% per year was applied as background growth to volumes derived with the committed development added as well. The 2023 daily volumes are shown in Figure 3 and projected 2023 turning movement volumes are shown in Figure 4.

A capacity analysis was again performed using Synchro software based on the 2023 volumes and with optimized traffic signal split, but retaining the existing cycle length (90 seconds) and offsets in the signal timings. The expected level of service was calculated and a summary of the analysis is contained in Table 7.

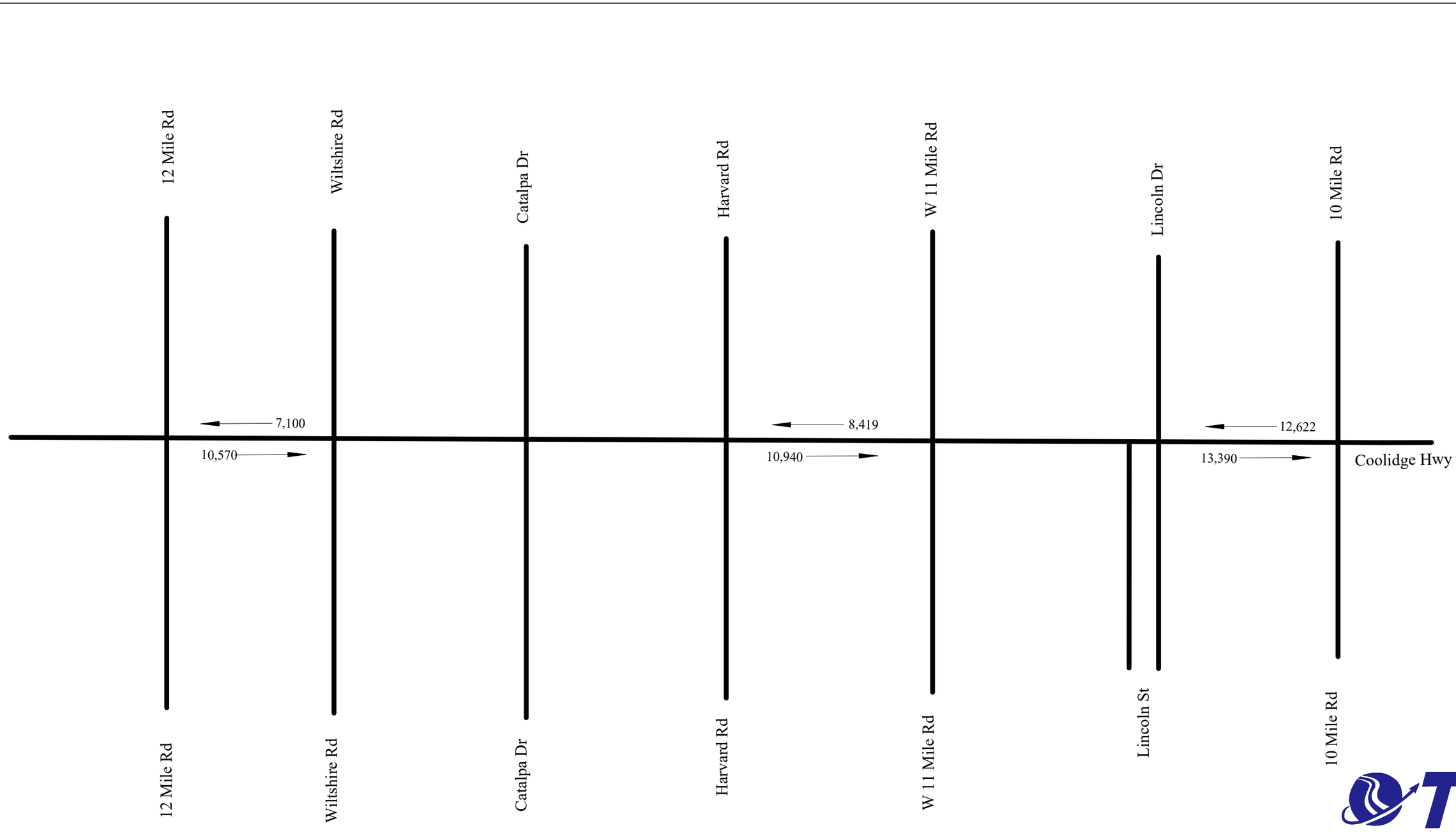
Table 7 Intersection Level of Service- 2023 Projected Geometry / Traffic

Intersection	AM Peak Level of Service	PM Peak Level of Service
10 Mile / Coolidge	B	C
Lincoln / Coolidge	C	B
11 Mile / Coolidge	D	C
Havard / Coolidge	B	B
Catalpa/ Coolidge	B	B
Wiltshire / Coolidge	C	D
12 Mile / Coolidge	E	D

In the 2023 horizon year there is some degradation of level of service is shown, but it is not significant. The AM peak level of service at 11 Mile / Coolidge is expected to operate at a LOS D and 12 Mile / Coolidge is expected to operate at LOS E. Level of service D is deemed an adequate level in most urbanized areas. The PM peak period retains the same levels of service for each intersection.

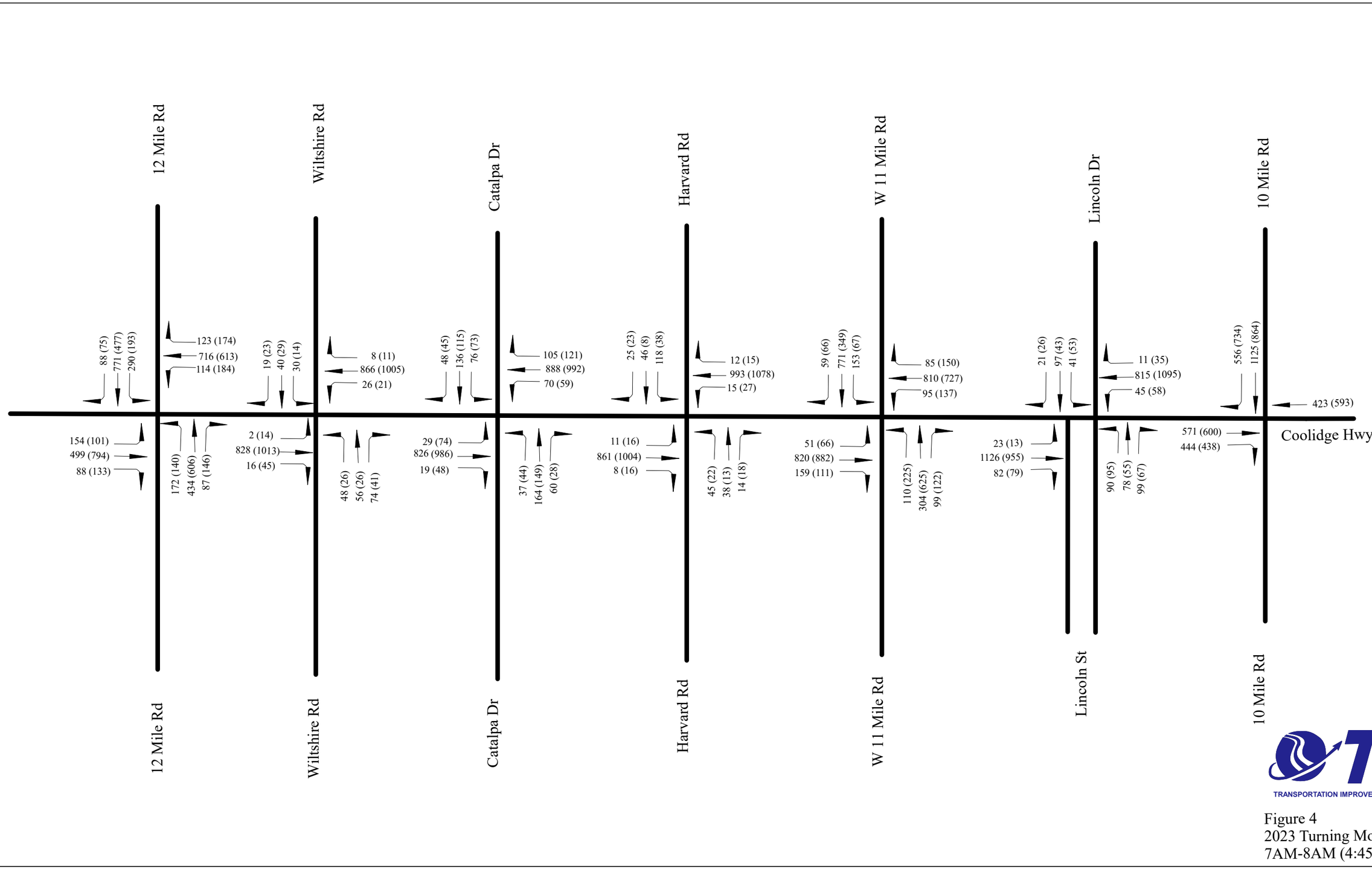
The analysis was rerun with modified signal timing, specifically increasing the cycle length across the corridor and removing as necessary signals from coordination. The optimization improves overall with corridor performance with a 120 second cycle length and removing two intersections form coordination. This still resulted in a level of service E at 12 Mile Road.

The corridor level of service is expected to be at LOS C for the both directions in the AM and PM peak periods. The arterial speeds are predicted to average 18.5 mph northbound and 20.5 southbound in the AM peak. The PM peak is expected to average 25.1 mph and 26.1 mph northbound and southbound respectively. These represent a decrease in average speed of 2-5 mph depending on time and direction



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 3
2023 Daily
Traffic Volumes



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 4
2023 Turning Movement Vols.
7AM-8AM (4:45PM-5:45PM)

Conclusions and Recommendations

Based on the analysis of the existing and future traffic operations, the reconfiguration of the roadway to three (3) lanes is feasible. The intersection level of service is acceptable with minimal deviations for the base condition of existing traffic volumes on the projected geometry.

The implementation of a three (3) lane cross section will reduce crashes within the corridor. Based on applicable research on such conversions a reduction in crashes on the order of 29% would be expected.

The future year 2023 traffic, which assumes background growth and anticipated development continues to operate at acceptable levels of service with the exception of 12 Mile and Coolidge in the AM peak hour. As the geometry of the intersection is unchanged by the proposed improvements, the situation will occur regardless. Future mitigation might be needed if the LaSalette property is developed. This might include turn lane additions for the westbound or northbound approaches.

The recommendations are as follows:

- Implement the three (3) lane cross-section beginning approximately 275 feet north of 10 Mile Rd and terminating approximately 130 feet south of Beverly Blvd.
- Convert through –right lanes to right turn only at needed signalized intersections
- Provide two (2) through lanes 11 feet in width and one (1) center turn lane a minimum of 10 feet in width.
- Repurpose excess space with bike lanes and /or widened parking lanes.
- Perform warrant analysis for possible removal of the traffic signals at Wiltshire and Harvard (low peak hour approach volumes).

Appendix A

Traffic Volume Data

Appendix B

Synchro Reports

Appendix C

Traffic Crash Data

11 Mile – 4 to 3 Conversion

City of Huntington Woods, Oak Park & Berkley

7/27/2018

Cawley, Patrick (TIA)

Contents

11 Mile – 4 to 3 Conversion

City of Huntington Woods, Oak Park & Berkley

Introduction

The Cities of Huntington Woods, Oak Park and Berkley have requested the Transportation Improvement Association (TIA) conduct a corridor study for 11 Mile Road between Greenfield Road and Woodward Avenue. The objective of the study is to assess the feasibility of reducing the cross section of 11 Mile Road to a three (3) lane cross section. The scope of the study includes evaluating the current and proposed traffic operations for the four (4) signalized intersections in the corridor. Additionally, the crash history of the corridor and the access point density will be examined.

Existing Geometry

The corridor currently has a four (4) lane cross section with a center turn lane at the Greenfield and Coolidge signalized intersections. The width is approximately 42 feet with four lanes at eleven to twelve feet each. No on street parking exists in this section.

Signalized intersections are present at Greenfield Road, Tyler Avenue, Coolidge Highway and Woodward Avenue. The posted speed limit is 35 mph from Greenfield Road to Coolidge Highway and 30 mph east of there to Woodward Avenue.

Access point density or driveway density measures the total number of access points onto the roadway, driveways and intersections, for a segment. It is a good measure of the suitability of a center turn lane. The number of access points for corridor segments are illustrated in Table 1. All the segments average more than 30 access points per mile, ranging from 67 per mile to 158 per mile. This is considered high for an arterial roadway.

Table 1 Access Point Density

Segment	Length (miles)	Number of Access Points
Greenfield Rd to Royal Ave	0.43	29
Royal Ave to Coolidge Hwy	0.54	40
Coolidge Hwy to Scotia Rd	0.50	53
Scotia Rd to Woodward Ave	0.75	119

Crash History

The three year crash history (2015-2017) was examined for the corridor. The areas which included a center turn lane were excluded from the summary. The results are shown in Table 2.

Table 2 Crash Frequencies

Segment	Total Crashes	Injury Crashes	PDO Crashes	Mitigated by Turn Lane*
Greenfield (east of) to Tyler	16	3	13	8
Tyler to Coolidge	27	6	21	12
Coolidge to Woodward	53	9	44	27
Corridor Complete	**96**	**18**	**78**	**47**

*Sideswipe same, rear end, rear end /left and head on /left type crashes.

Within the study limits, 14 side-swipe same type crashes occurred. These are due to lane changes as vehicles avoid traffic turning. Additionally, 28 rear-end crashes occurred in the corridor. These are typically the result of vehicle stopping or slowing to turn and can be mitigated by the addition of center turn lane.

The conversion of a 4 lane roadway to a 3 lane roadway with center turn lane has been shown to reduce crashes. The expected decrease in crashes would be 29% of all crashes (in the existing 4 lane section).

Existing Traffic Operations

For the study both manual peak hour turning movement counts and 24 hour automatic counts were collected. Figure 1 contains the daily traffic volumes and Figure 2 illustrates the peak hour counts at the major intersections.

Using the existing traffic volumes and the current signal timings, a capacity analysis was performed using Synchro software. The corridor was modeled as a network from Greenfield Road to Woodward Avenue. Based on the *Highway Capacity Manual* methodologies the level of service (LOS) was generated. Table 3 illustrates the levels of service definitions per the HCM.

Table 3 Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (secs/veh)	General Description
A	0-10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

The summary of the analysis is contained in Table 4. The complete Synchro reports are contained in Appendix B.

Table 4 Intersection Level of Service- Existing Conditions

Intersection	AM Peak Level of Service	PM Peak Level of Service
11 Mile / Greenfield	D	D
11 Mile / Tyler	A	A
11 Mile / Coolidge	D	D
11 Mile / Woodward (SB)	C	C

Travel time runs were conducted along the corridor to measure the existing time it takes to travel between Greenfield and Woodward. The runs occurred during the AM and PM peak hours. The results are contained in Table 5. The travel times are important to collect prior to any changes; as post implementation it is a key measure to evaluate.

Table 5 Travel Time Runs- average time

Segment	AM Peak	PM Peak
EB – Greenfield to Woodward	4'36"	5'31"
WB – Woodward to Greenfield	4'42"	4'-56"

Using the average travel times per direction and the length of the corridor this equates to an average speed eastbound of 28.8 miles per hour in the AM period and 24.1 miles per hour in the PM peak. The westbound average speeds were 28.2 mph and 26.9 mph respectively.

The Synchro model was also used to the gauge the arterial level of service for 11 Mile Road. The arterial level of service of for the Am peak period was C/D for eastbound / westbound respectively. The PM peak period reported level of service D /D, respectively.

Existing Traffic with Proposed Geometry

As the comparison of existing traffic with the 3 lane cross section is relevant to measure the impact of any such changes, Synchro was again utilized to assess level of service. The existing traffic volumes were tested with the proposed geometry and the signal timing was optimized by the software for each intersection. The approach laneage was keep the same for the Greenfield and Woodward intersections, with assumed transitions occurring approximately 600 feet from the intersection. The three (3) lane section was carried through the Tyler / Buckingham intersection and the through-right lanes were converted to right only lanes at Coolidge.

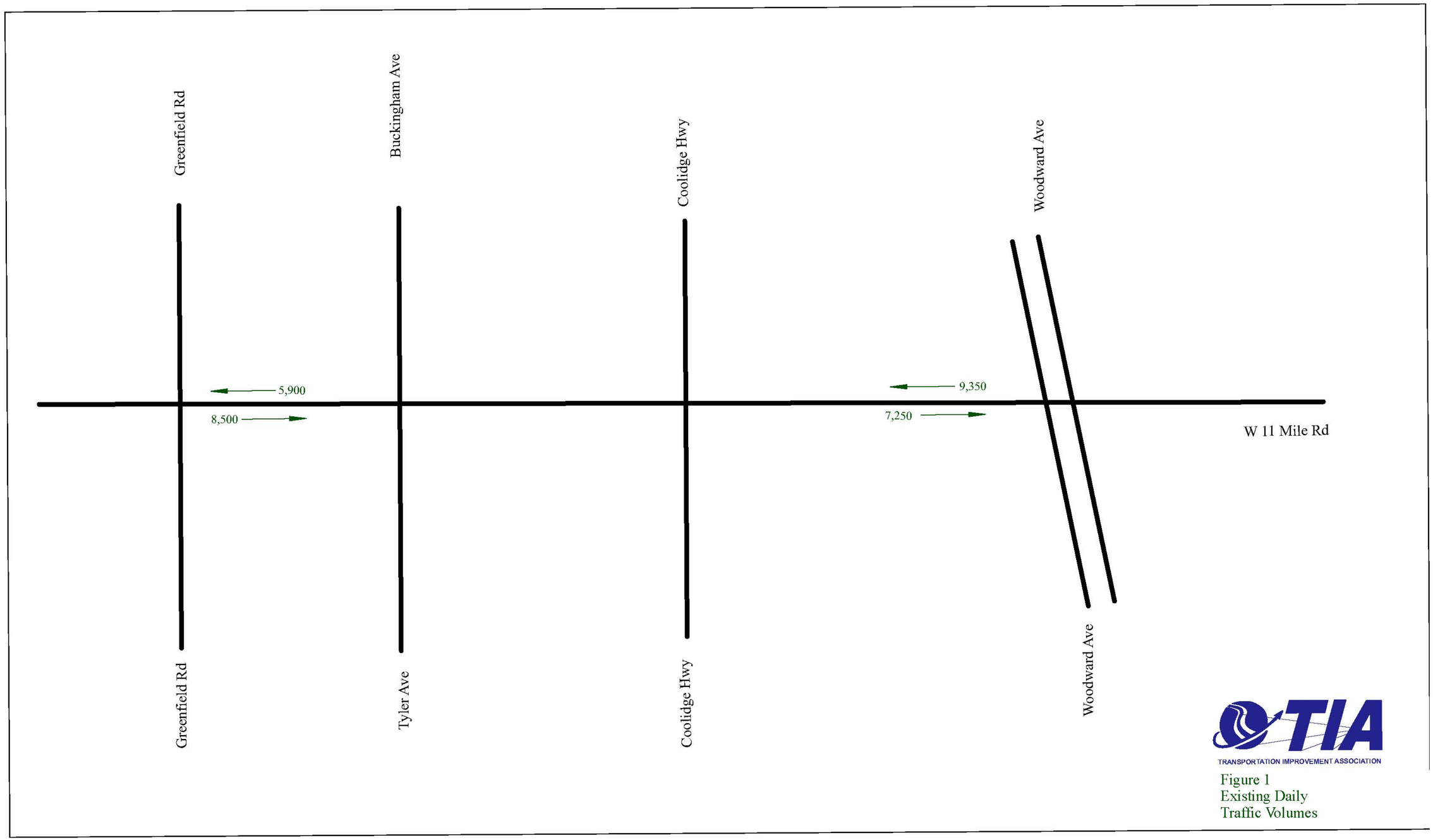
Table 6 summarizes the intersection level of services. There are some decreases in level of services, particularly the Coolidge Highway intersection, which would operate with LOS F with reductions in the geometry for both roadways. Arterial level of service remained in the same at C / D.

Table 6 Intersection Level of Service- Projected Geometry-Existing Traffic

Intersection	AM Peak Level of Service	PM Peak Level of Service
11 Mile / Greenfield	D	D
11 Mile / Tyler	A	A
11 Mile / Coolidge	F	F
11 Mile / Woodward (SB)	C	C

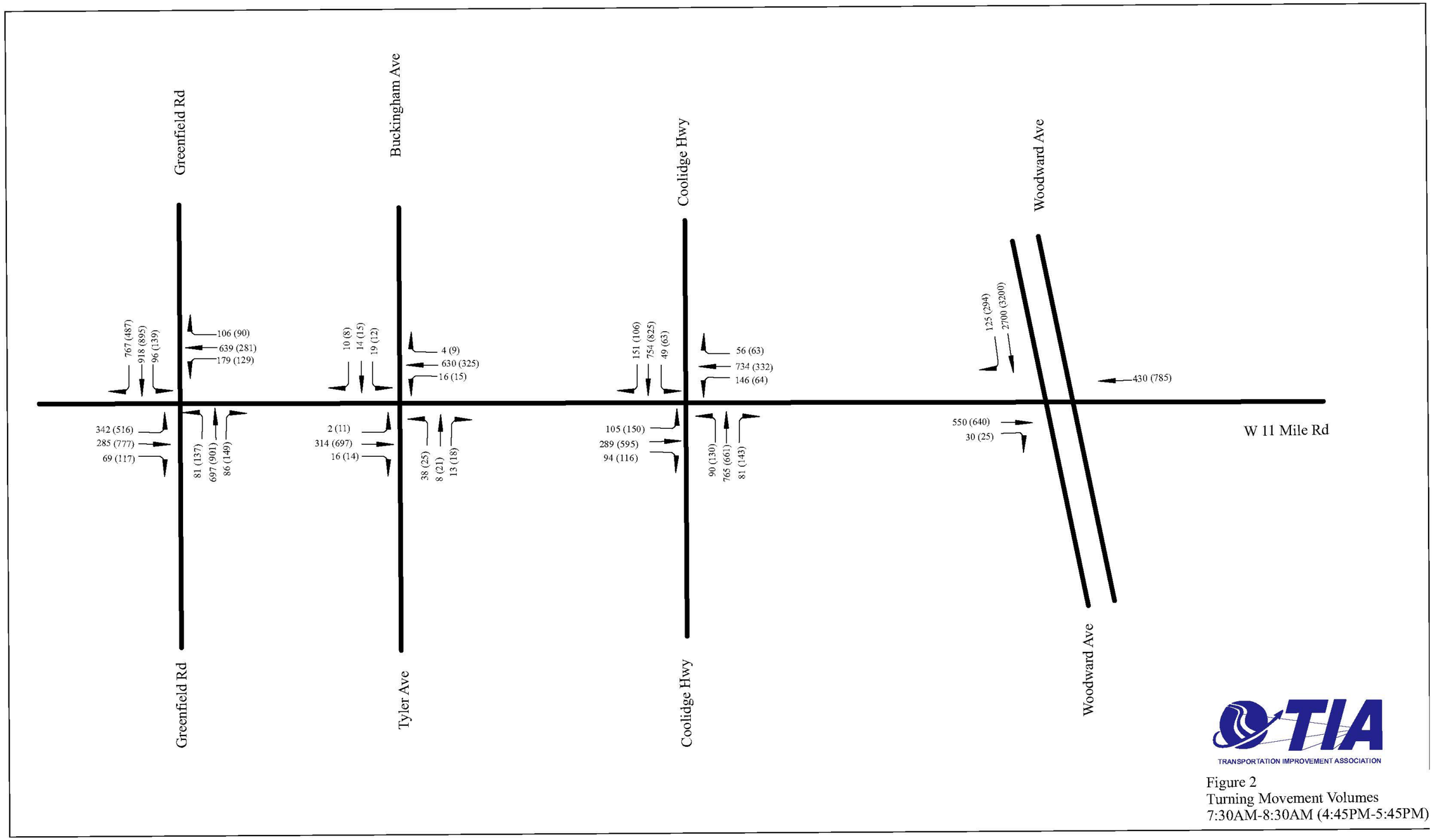
Aside from the Coolidge Highway intersection, it appears the proposed 3 lane geometry is feasible. Additional modeling was performed with changes to the geometry at Coolidge Highway. The east-west approaches were assumed to have two through lanes, one through lane and one through right lane. With this geometry the expected level of service would be LOS D. Within the existing roadway footprint this would require the termination of a dedicated bike lane for one or both directions, and the use of a shared lane configuration.

The through lane could be dropped beyond the intersection and 3 lane cross section resumed. With this modification the performance would be very similar to existing conditions.



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 1
Existing Daily
Traffic Volumes



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 2
Turning Movement Volumes
7:30AM-8:30AM (4:45PM-5:45PM)

SEMCOG Travel Demand Modeling

As a part of the Coolidge Road Study completed in spring 2018, the City of Berkeley requested that the Southeast Michigan Council of Governments (SEMCOG) perform modeling of the impact to the network if the geometry of Coolidge Highway is reduced. SEMCOG provided models for the existing condition, the 2040 with existing network and the 2040 with proposed changes.

Based on the macroscopic travel demand model traffic is expected to shift to adjacent roadways. A macroscopic model relies on a rough approximations of the roadway link capacity and in this case it appears to overestimate the amount of diversion. In a signalized roadway network the intersection performance will drive the throughput of the corridor. To assess this involves the micro level analysis, such as contained within the report and this is likely not reflected in the SEMCOG modeling.

The other aspect of the SEMCOG modeling is the expected growth of traffic within the corridor. Based on the comparison of existing traffic to 2040 traffic, it is predicted to have a net decrease in traffic volumes.

Projected Traffic Conditions (2023)

The proposed improvements will consist of pavement marking modifications and as such they will have a service life of 5 years or less. Based on this a horizon year of 2023 was chosen for the projected condition.

At signalized intersections the within the corridor, the geometry is as described previously. With the three (3) lane cross section in place starting approximately 600 feet east from the Greenfield Road and ending approximately 250 feet west of Woodward Avenue. The Coolidge Highway intersection was assumed to have through- right lanes which carry across the intersections and drop appropriately downstream.

As stated earlier the SEMCOG projections show a net decrease in traffic volumes over time. In order to perform a conservative analysis an assumption that some short term growth will occur. In this case a growth rate of 1.0% per year was applied as background growth to volumes derived with the committed development added as well. The 2023 daily volumes are shown in Figure 3 and projected 2023 turning movement volumes are shown in Figure 4.

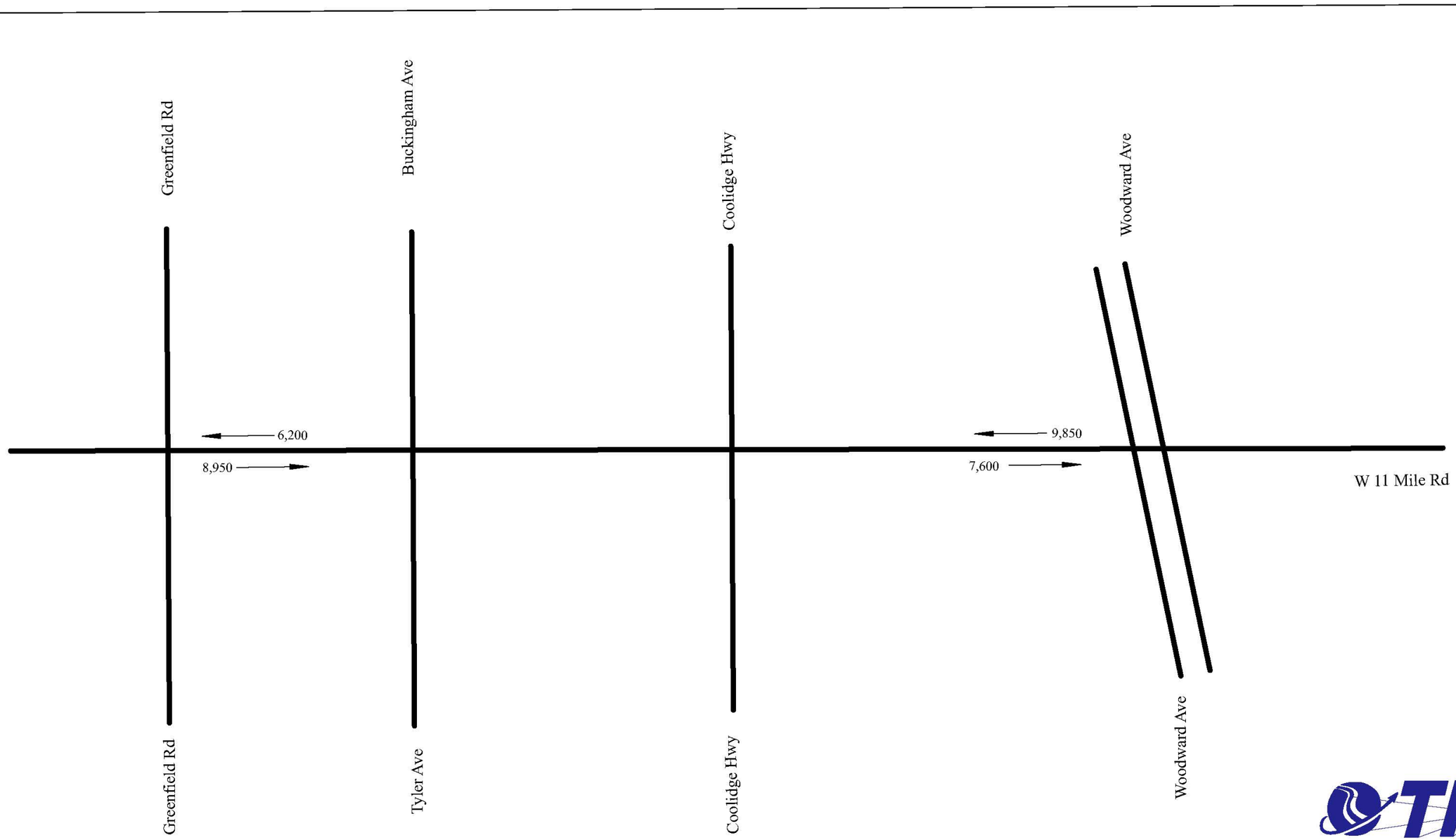
A capacity analysis was again performed using Synchro software based on the 2023 volumes and with optimized traffic signal timings. The expected level of service was calculated and a summary of the analysis is contained in Table 7.

Table 7 Intersection Level of Service- 2023 Projected Geometry / Traffic

Intersection	AM Peak Level of Service	PM Peak Level of Service
11 Mile / Greenfield	E	E
11 Mile / Tyler	A	B
11 Mile / Coolidge	D	D
11 Mile / Woodward (SB)	C	D

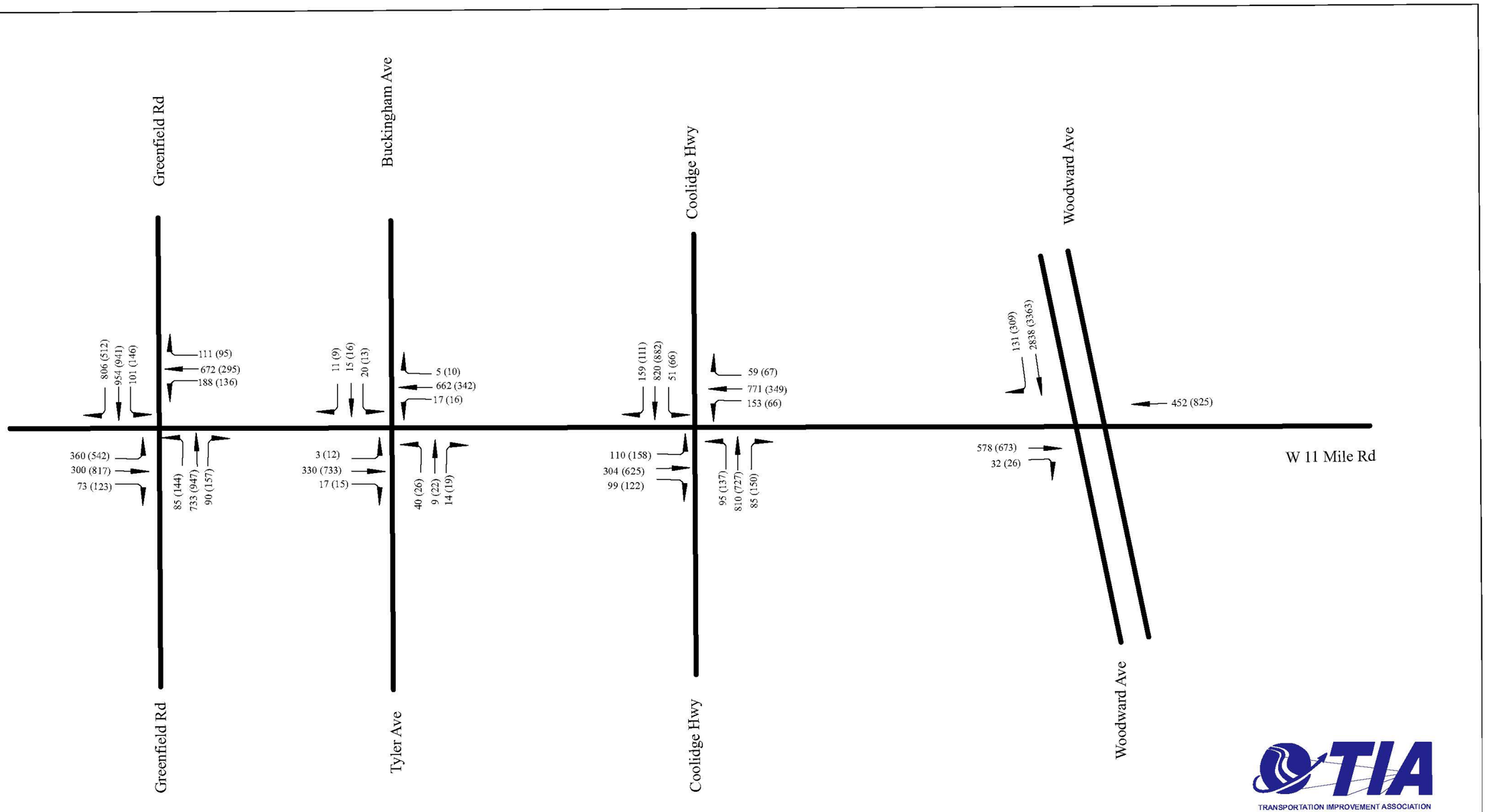
In the 2023 horizon year there is some degradation of level of service as shown above. The AM peak hour level of service at 11 Mile / Coolidge is expected to be a LOS D and the PM peak at LOS D. Level of service D is deemed an adequate level in most urbanized areas. At the Greenfield Road and Woodward Avenue intersections, level of service declines and this is related only to the projected growth in traffic (no geometric changes are proposed).

The corridor level of service is expected to be at the same LOS C /D for the Am peak period and LOS C for both directions in the PM peak period. The arterial speeds were predicted to have slightly higher speeds, likely due to the signal optimization performed with the software.



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 3
2023 Daily
Traffic Volumes



TRANSPORTATION IMPROVEMENT ASSOCIATION

Figure 4
2023 Turning Movement Vols.
7:30AM-8:30AM (4:45PM-5:45PM)

Conclusions and Recommendations

Based on the analysis of the existing and future traffic operations, the reconfiguration of the roadway to three (3) lanes is feasible. The intersection level of service is acceptable with minimal deviations for the base condition of existing traffic volumes on the projected geometry.

The implementation of a three (3) lane cross section will reduce crashes within the corridor. Based on applicable research on such conversions a reduction in crashes on the order of 29% would be expected.

The future year 2023 traffic, which conservatively assumes some level of background growth continues to operate at acceptable levels of service with the exception of the Greenfield Road intersection. Additionally, the Woodward Avenue intersection is seen to decline. As the geometry of both intersections are unchanged by the proposed improvements, the situation will occur regardless.

The recommendations are as follows:

- Implement the three (3) lane cross-section beginning approximately 600 feet east of Greenfield Road and terminating approximately 230 feet west of Woodward Avenue.
- Provide two (2) through lanes 11 feet in width and one (1) center turn lane a minimum of 10 feet in width.
- Repurpose excess space with five (5) feet bike lanes.
- Convert through –right lanes to right turn only at needed signalized intersections.
- Provide two (2) through lanes on the eastbound and westbound 11 Mile at Coolidge Highway. To terminate 350 - 600 feet beyond the intersection.

Appendix A

Traffic Volume Data

Appendix B

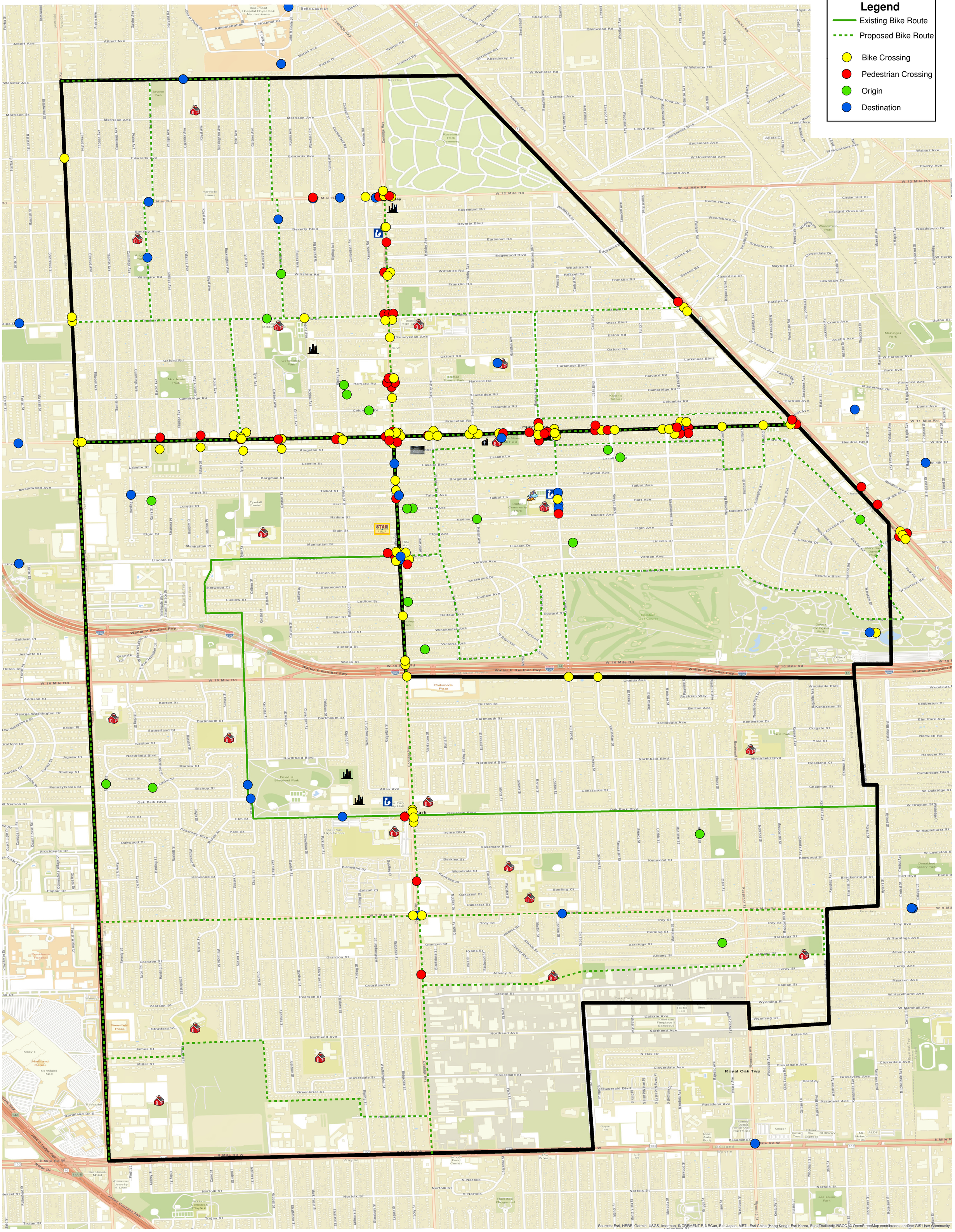
Synchro Reports

Appendix C

Traffic Crash Data

Where do you bike or walk to?

All Meetings



Multi-Community Planning Grant – Public Information Meetings
Summary of Written Comments

	COMMENTS	NAME	ADDRESS	PHONE	EMAIL	Meeting
1	No Comment	*Esther Ingber*	25961 Marlowe Pl. Oak Park, MI	248-967-6380	estheringber@gmail.com	Oak Park 2/26/19
2	I like to bike but I worry that the road diet will lead to traffic congestion. I hope the computer modeling that says it will not is based on accurate data. I think it would be great to put in place bio swales, permeable pavement, and other measures to reduce flooding. Thank you!	*Beth Snider*	226981 Raine Oak Park, MI	968-3322	bsnider67@aol.com	Oak Park 2/26/19
3	I love the idea of doing a road diet on 11 mile, especially as more businesses move in. I think that we should focus on making 11 mile more walkable, including making the sidewalks consistently wider and making sure businesses have room for outdoor seating. I think that we should also add a couple more crosswalks.	*Avi Snider*	14741 Talbot Oak Park, MI	248-778-8732	avisnider@hotmail.com	Oak Park 2/26/19
4	It's a great idea. I hope they do it. (Both green infrastructure and road diet)	*Gerald Acker*	17000 W 10 Mile Southfield, MI	248-843-5000	gacker@goodmanacker.com	Recv'd via Email
5	I was not able to attend the recent meeting regarding the bike lane proposal for HW but wanted to let you know that I wholeheartedly support this initiative. From pedestrian safety to environmental benefits I am very happy to see this plan in the works. Thanks for the support and I'm excited to see the project underway!	*Evan Kardon*			evankardon@gmail.com	Recv'd via Email

Oak Park February 26, 2019 (5 pm to 7 pm)
Huntington Woods February 27, 2019 (6 pm to 8 pm)
Berkley March 14, 2019 (6 pm to 8 pm)

Multi-Community Planning Grant – Public Information Meetings
Summary of Written Comments

6	Good Morning, I'll be unable to attend the Open Houses so am providing my feedback here regarding 11 Mile and Coolidge. As a resident of HW and a cyclist who rides 1,500-2,000 miles annually, mostly in the City of Detroit, the most unsafe I feel is north of 8 Mile. Riding on Coolidge and 11 Mile Road would be much improved if we had protected bike lanes. 11 Mile in particular would be well served by a lane diet that changes things to have a protected bike lane, a traffic lane, a central turning lane, and a traffic lane and bike lane going the opposite direction. This would be a great help as well to the homeowners on 11 Mile who I see daily struggling to back out and have only traffic lanes to go to. A central turning lane would give them a way to more safely exit their homes. On the Huntington Woods side of 11 Mile, a bike lane would help create an additional buffer at the 2 ornate entrances with the brick structures. Motorists routinely roll right through the stop line to have a vantage point for making their turn. Having the extra room for a bike lane would give both cyclist and motorist more time and space to react. The Oak Park and Berkley part of 11 mile has many businesses with building that line up closely to the road Protected bike lanes will help cyclists avoid cars jutting past those buildings before stopping. There are no mirrors along the buildings to help cars and bikes see around corners. Coolidge itself would also be well served with a protected bike lanes. Additionally, this will make street crossing by pedestrians easier by shrinking the motorized space they need to cross. Many families with strollers cross 11 Mile in HW and Coolidge to get	*Jeff Spakowski*		248-915-0415	jfspakowski@gmail.com	Recv'd via Email

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Multi-Community Planning Grant – Public Information Meetings
Summary of Written Comments

	to our parks that are along those roads. Dog walkers do the same. The center lane on Coolidge and Huntington Woods can have islands built for pedestrians to have a place to shelter half-way across. Recently, Royal Oak reconfigured Main Street in such a manner, and now that corridor up to Clawson is much safer. I would love to see our 3 communities come together to make things better here as well. The congested part of Coolidge between 11 and 12 mile would be well served by several islands for pedestrians. As part of the broader network, I'm sure you're well aware of the Joe Louis Greenway. (https://detroitgreenways.org/joe-louis-greenway/) If we can add protected bike lines down Coolidge, that will only make it safer to get to the Greenway. The work Oak Park is doing on 9 Mile will help as well. In HW, it would help to have the dirt path along Huntington Road that goes into the resident's driveway to get to the Zoo and Woodward be converted to a paved path that doesn't make use of the driveway. In Oak Park, Scotia ends before it turns into Meyers. It would help to have a concrete path to traverse that field. In Berkley, it would help to have an pedestrians/bicycle entrance to Beaumont to avoid going around the entire border of to access. If we do create protected bike lanes on Coolidge, that may make putting a MoGo station there appropriate. Looking forward to seeing how this develops					

Multi-Community Planning Grant – Public Information Meetings
Summary of Written Comments

7	As a resident one block off of 11 mile between Woodward and Coolidge, I am very concerned about my safety in a car with another road diet. It is already very difficult at times to make a left on 11 mile. Pushing the traffic into 2 lanes will make it much worse. Princeton alread picks up traffic since it is parellel to 11 mile. There is a constant problem with speeding drivers and drivers who do not stop at stop signs.	*Nancy Stimac*	1259 Princeton		nastimac@aol.com	Berkley 3/14/19
8	I love the potential of having designated bike lanes all the way from Berkley to Ferndale – what a wonderful way to promote regional partnerships, greener optons of travel, and healtier residents. Exciting Stuff! I do thing that more trees on 11 Mile (instead of rain gardens) will be better & an easier sell.	*Natalie Price*			Natalie.w.price@gmail.com	Berkley 3/14/19

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Multi-Community Planning Grant – Public Information Meetings
Summary of Written Comments

9	1. I rarely see bicycles on 12 mile, Coolidge, or 11 Mile Roads. 2. Why are "we" trying to crowd out Berkley's commercial/industrial area on 11 Mile – we need some place for it to go. Try to transition The Auto Repair shops to 11 Mile & out of The Downtown. We do not need another Downtown on 11 Mile. 3. Why no parking added in front of houses on 11 Mile Rd? 4. Isn't a stable industrial/commercial more steady of a tax base that smaller businesses that more in & out? 5. Why frustrate drivers by slowing down all streets that were built to move cars from ~~east to west~~ to one area to another? 6. I really believe that some traffic will move from 11 Mile & Coolidge into the neighborhoods. This greatly diminished the enjoyment of our homes. I already experience this on Wiltshire with cars moving from/to Woodward & Coolidge (and Greenfield Thru), cars/drivers speed & the volumes makes it very difficult to back out of driveways. I expect this problem will increase with a road diet on Coolidge. (Google it – drivers will divert to roads with less traffic). 7. I do like the water mitigation efforts on all roads – (but not in the middle of the road). Landscaping is needed, And softscape is needed to make Coolidge & 12 Mile much more attractive. 8. I don't see much foot or bike traffic to be accommodated on 11 Mile. I think most people cross at the intersections (Coolidge & Greenfield) and at Gardner for kids walking to/from Norup. & possibly at Berkley for the fireworks or baseball games.	*Barbara Morris*	1714 Wiltshire Rd Berkley, MI	248-399-6374	Barbmorris1714@gmail.com	Berkley 3/14/19

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Multi-Community Planning Grant – Public Information Meetings
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	9. They made this change for on Livernois between 12 Mile to 14 Mile – It is horrible, going the new speed limit of 25 mile per hr. is excruciating. And, I believe, dangerous. The bike lanes that turn into right turn lanes are dangerous. It is confusing to know what drivers should do, fortunately, bikes rarely, if ever, travel there. I see a problem with this for Berkley. 10. If this road diet does happen on 11 Mile, the homes betw Coolige & Woodward really need on street parking. They have a lot of problems moving cars in/out of their driveways. They should be accommodated.					
10	I like the idea of additional green space/green infrastructure. I think it is wiser to start and assess the Coolidge road diet before continuing to road diet the surrounding roads. One thing at a time, finish it, assess it, then move on. Also, I suspect the residents on 11 miles would lover the ability to park in front of their homes for car juggling times. It really seems that bike lanes are not uses as often as we would like to se, so I wonder if that is the best use of the land? There must, must, MUST be education for drivers on how to navigate the intersections. PLEASE sponsor some sort of assembly at the high school to help them learn. These things are not taught in drivers ed.	*Anonymous*				Berkley 3/14/19
11	Please: Restaurants, cafes, nice Stores & condo buildings Or townhouses on 11 mile Road & Coolidge. It will Make the area a walking destination!	*Rabbi Asher Lopatin*	13345 Victoria, Huntington Woods MI	773-206-0009	motownrabbi@gmail.com	Berkley 3/14/19

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Multi-Community Planning Grant – Public Information Meetings
Summary of Written Comments

12	I would like to see the zoning plan & coordination btwn the 3 cities for 11 mile road & Coolidge, what is the vision once the roads & sidewalks are improved & redesigned? Stores, cafes, small shops, restaurants, bistros, art gallery. What is vision to make it cool/hip & to improve cities' vibrancy mixed used w/ residential?	*Anonymous*	Harvard, Berkley			Berkley 3/14/19

Comments summarized herein are transcribed verbatim from actual handwritten comment sheets and emails.