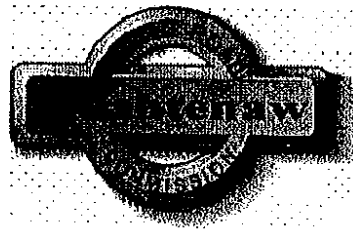


# STATE ROAD CORRIDOR STUDY

## FINAL REPORT

PREPARED FOR:



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## 4.0 ALTERNATIVES CONSIDERED

As part of the State Road Corridor Study process the Project Partners worked to establish the alternatives and evaluation criteria to be utilized at the beginning of the study. Three alternatives in addition to a No-Build Alternative were proposed as design alternatives for the corridor. There were also three segments of State Road to be assessed. The three segments were:

- Textile Road to Ellsworth Road
- Michigan Avenue (US-12) to Textile Road
- Bemis Road to Michigan Avenue (US-12)

The alternatives to be analyzed were as follows:

- No-Build Alternative – No changes are made to the roadway. The roadway would remain as it is today.
- Three-Lane Alternative – One travel lane in each direction with a center left-turn lane.
- Four-Lane Boulevard Alternative – Two travel lanes in each direction with a median separating northbound and southbound traffic that provides storage for crossover traffic.
- Five-Lane Alternative – Two travel lanes in each direction with a center left-turn lane.

The No-Build Alternative was evaluated to see if the corridor can operate acceptably in the future with no significant improvements other than those proposed currently (US-12 improvements). In other words, if the corridor were left as it is today and adequately maintained, could it operate at an acceptable level of service in the future by managing only the transportation system already in place, i.e. signal timings, speed limits, and signing.

The Three-Lane Alternative was evaluated because it is a highly cost-effective improvement to the corridor from a safety standpoint. Although no significant capacity is added to the corridor by the addition of a center left-turn lane, crash rates when compared with a two-lane roadway with no center left-turn lane are expected to be reduced. The center left-turn lane allows for the removal of left-turn vehicles from the through traffic stream, creating less of a disruption to through traffic and reducing the risk of rear-end type crashes. This can also reduce the delays for through traffic stopped by a vehicle waiting to turn left from the through lane.

The Four-Lane Boulevard and Five-Lane Alternatives were evaluated because they provide significant increases in capacity to the corridor. If the No-Build or Three-Lane Alternatives cannot meet the future traffic demands of the corridor, than an alternative that can provide additional capacity to meet these traffic demands should be selected. The Four-Lane Boulevard and Five-Lane Alternatives add one additional through lane in each direction to increase the capacity along the corridor and provide safety for left-turning vehicles. The Four-Lane Boulevard Alternative provides storage for crossover traffic within the median and the Five-Lane Alternative has a center left-turn lane to remove left-turning traffic from the through traffic stream. Both of these alternatives enhance both capacity and safety along the corridor, which makes them viable options to be evaluated as alternatives for the corridor.

An alternative with four travel lanes and no other geometric improvements was not selected to be evaluated. Four lanes can increase the capacity of the corridor, but turning movements in the two inner lanes significantly reduces their capacity- up to 50% depending upon the number of left turns. In addition a four lane road would not reduce crash rates. Left-turning traffic cannot be removed from the through traffic stream in this type of alternative and therefore the number

of rear-end type crashes is expected to increase when more capacity is provided along the corridor.

The study corridor itself was broken into three key sections based on the character and land uses along the corridor (see Section 3.1). These three segments were Textile Road to Ellsworth Road, Michigan Avenue (US-12) to Textile Road, and Bemis Road to Michigan Avenue (US-12).

More detailed descriptions of the alternatives are provided in the following sections. It should be noted that the cross-sections described are preliminary in nature and are used only for the preliminary evaluations of the alternatives in Chapters 5.0 and 6.0. The final recommendations for the cross-sections of the recommended alternative are provided in Chapter 7.0.

#### **4.1 No-Build Alternative**

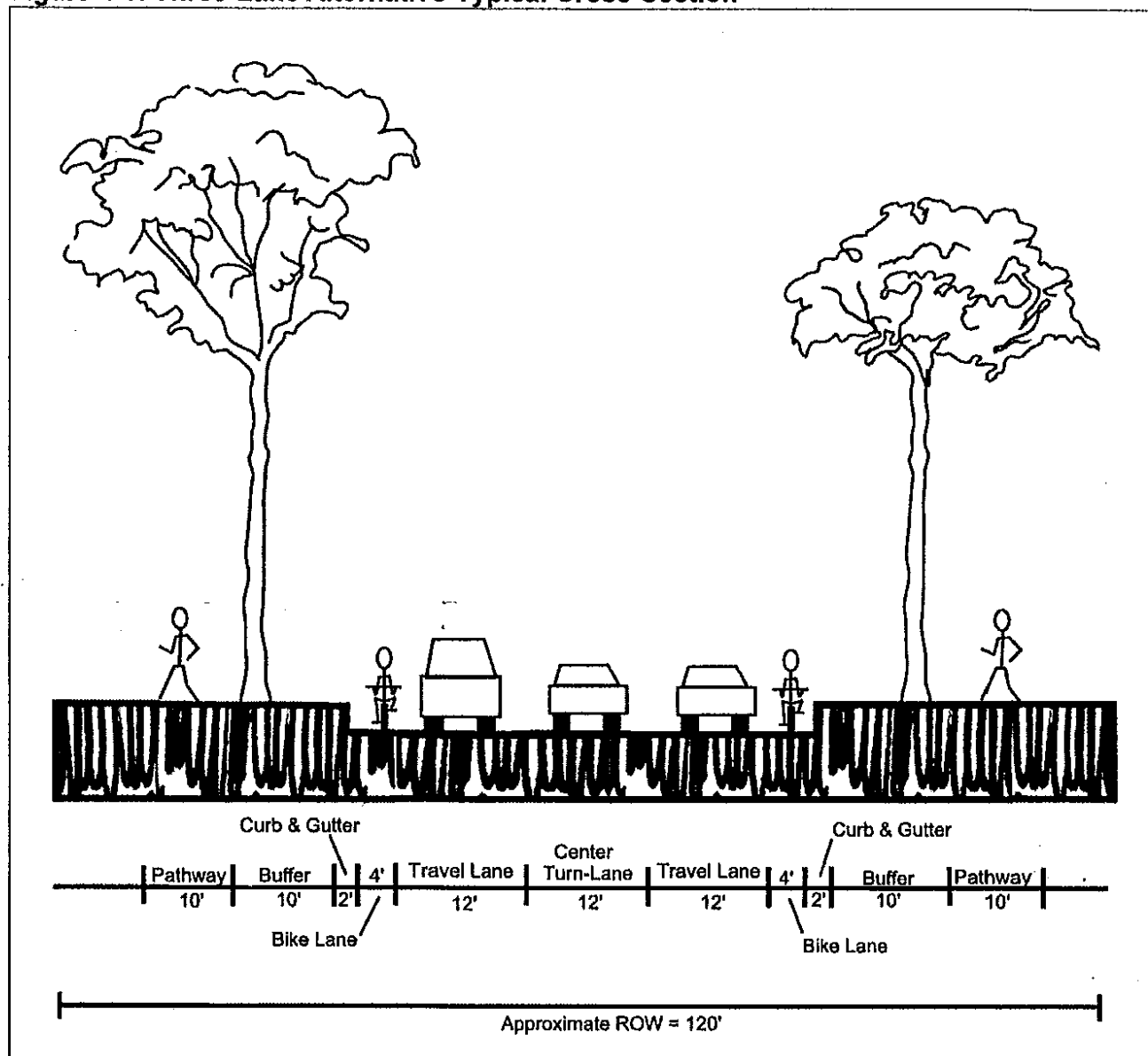
As indicated earlier, the No-Build Alternative was evaluated because it is important to first see if the corridor can operate acceptably in the future with no significant improvements other than those proposed currently (US-12 improvements and the signalization of the Textile Road at State Road intersection). This alternative would leave the State Road/Moon Road corridor geometry the same as it is today, a two-lane roadway with scattered deceleration lanes for driveways and turn-pockets at some intersections. This alternative is attractive from a cost standpoint, but provides no additional capacity or significant safety improvements when compared to the other alternatives.

#### **4.2 Three-Lane Alternative**

The Three-Lane Alternative has one travel lane in each direction with a continuous center left-turn lane. Figure 4-1 depicts a typical cross-section for the Three-Lane Alternative (figure is not to scale). The cross-section allows for a 4-foot shoulder on each side that could be utilized as a bicycle lane. Pathways (10-foot wide) are also proposed on both sides of the roadway with a 10-foot buffer between the back of curb and the edge of the pathway that can be used for landscaping or an alternative area for a bike path. The 10-foot pathways are proposed based on standards set in the Pittsfield Township Master Plan. The lane-widths are wide enough to accommodate transit vehicles, and transit stops/shelters could also be provided within the 10-foot buffer space. The approximate right-of-way (ROW) footprint required for this cross-section ranges from approximately 88-feet to 120-feet. Right-of-way includes the area required for utilities, pathways, curb and gutter, travel lanes, and a buffer.

The only alternative that requires less ROW than the Three-Lane Alternative is the No-Build Alternative. The alternative is best fit for an area where traffic volumes are expected to be relatively low, but the number of left-turning vehicles is significant enough to disrupt through traffic without a center left-turn lane. The center left-turn lane allows for the removal of left-turn vehicles from the through traffic stream, creating less of a disruption to through traffic and reducing the risk of rear-end type crashes. This type of design is also practical where there are many closely spaced driveways with access to the main roadway. Access to driveways connecting to the State Road/Moon Road corridor is not restricted with this design alternative.

Figure 4-1: Three-Lane Alternative Typical Cross-Section



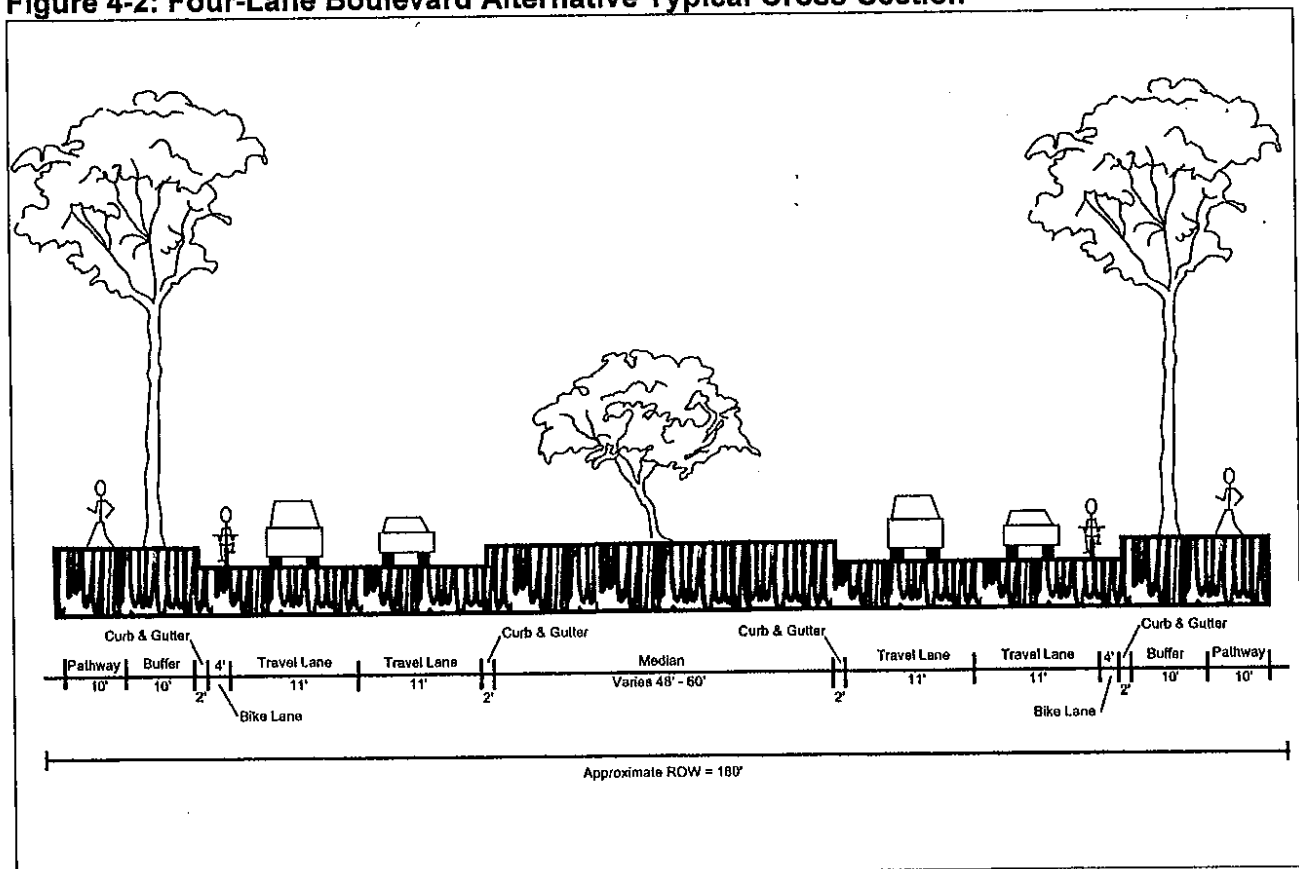
#### 4.2.1 Four-Lane Boulevard Alternative

The Four-Lane Boulevard Alternative has two travel lanes in each direction with a median separating the northbound and southbound travel lanes. Curb and gutter is proposed along both the median and outside travel lanes. A 4-foot shoulder is provided along the outside travel lanes that could also be utilized as a bicycle lane. Figure 4-2 illustrates a typical cross-section for this design alternative (figure is not to scale). Pathways (10-foot wide) are also proposed on both sides of the roadway with a 10-foot buffer between the back of curb and the edge of the pathway that can be used for landscaping or an alternative area for a bike path. The 10-foot pathways are proposed based on standards set in the Pittsfield Township Master Plan. The lane-widths are wide enough to accommodate transit vehicles, and transit stops/shelters could also be provided within the 10-foot buffer space.

Median width can vary greatly, but the 60-foot wide median shown in Figure 4-2 is the recommended width necessary to provide a crossover for a single-unit truck or 40-foot bus to turn from the crossover into an outside travel lane in the opposite direction. Smaller median widths could be utilized, but the crossovers would be limited to smaller vehicles (passenger car vehicles) making access to driveways with no direct left-turn access difficult for drivers of large trucks and busses. However, the median width could be narrowed and then flare out to the 60-foot width where crossovers are to be provided in order to conserve the amount of ROW impacted along the corridor. The 60-foot median also provides the required width necessary to accommodate turnaround vehicle storage within the median as a left-turn pocket. This limits the disruption to through traffic and helps to reduce rear-end crashes when compared to boulevard alternatives where no storage for turnaround traffic is provided within the median. Landscaping could also be accommodated within the median.

The Four-Lane Boulevard Alternative requires the largest ROW footprint among the alternatives (ranging from approximately 160-feet to 180-feet), and correspondingly provides the largest amount of vehicle capacity. Right-of-way includes the area required for utilities, pathways, curb and gutter, travel lanes, and a buffer. The alternative is best fit for an area where traffic volumes are high and left-turn volumes at intersections severely limit the capacity of the intersections. The median dividing northbound and southbound traffic also enhances the safety of the roadway and helps to reduce certain crash types. This alternative also limits direct access to some driveways to preserve vehicle flow along the main roadway. Motorists desiring to travel to the driveways where direct access is not provided must utilize a median crossover to gain indirect access to the driveway.

**Figure 4-2: Four-Lane Boulevard Alternative Typical Cross-Section**



## 7.0 RECOMMENDATIONS

This chapter documents the recommended alternative for each of the three segments of the study corridor. Intersection treatments as well as other enhancements along the corridor are also discussed.

### 7.1 Recommended Alternative Summary

Based on a thorough investigation of mobility, land use and cost considerations, the following recommended for each corridor segment.

#### Segment 1 – Textile Road to Ellsworth Road: Four-Lane Boulevard Alternative

The segment has many driveways that lead to businesses and business parks that intersect State Road. The Four-Lane Boulevard Alternative is the only alternative expected to allow these driveways and minor streets to operate at acceptable levels of service throughout the day. The provision of a center median would prohibit direct left turns at these driveway locations, thereby reducing delay associated with left-turn movements, while decreasing the potential for certain crash-types, such as head-on crashes. The median also provides a safe refuge for pedestrians crossing the roadway and reduces the total amount of pavement a pedestrian must cross at any one time. The additional landscaping that could occur within the median can also greatly enhance the aesthetic quality of this portion of the corridor.

#### Segment 2 – Michigan Avenue (US-12) to Textile Road: Five-Lane Alternative

For this segment the Five-Lane Alternative would provide the needed increase in capacity based on growth projections. It would also preserve direct access for existing and future major traffic generators along the corridor. The addition of a center left-turn lane would provide refuge for turning vehicles, thereby reducing disruption of through traffic and decreasing the potential for rear-end crashes.

#### Segment 3 – Bemis Road to Michigan Avenue: Three-Lane Alternative

The three-lane alternative is anticipated to meet the mobility needs of this segment while fitting within the more rural context of this portion of the corridor.

### 7.2 Recommended Intersection Treatments

The following are recommended intersection treatments at critical intersections along each of the three study segments that are expected to be necessary for the intersections to maintain acceptable operating conditions through the planning horizon.

#### Bemis Road at Moon Road

This intersection should be signalized with left and right-turn pockets constructed on all approaches in order to maintain acceptable performance through the planning horizon. The intersection will have to be monitored in the future to determine when it meets signal warrants. It is anticipated to require signalizing prior to the year 2025.