Appendix C

Alternatives Analysis Report

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MONROE NEIGHBORHOOD STREET DESIGN PLAN

Alternatives Analysis Report

December 2015

Contents

Introduction and Context

Located in northern Clackamas County, Monroe Street has been envisioned by local and regional governments as a primary active transportation route stretching east from the Trolley Trail in Milwaukie to the Interstate 205 Multi-Use Path in the unincorporated portion of the County. This connection would improve local access to two lines on the MAX regional light rail system – the Green Line along I-205 and the newly completed Orange Line in Milwaukie – and would provide safer bicycling and walking to and within the Clackamas Regional Center. Ultimately, the project would link downtown Milwaukie, the Clackamas Town Center, and destinations to the north, connecting local neighborhoods to schools, jobs, shopping and parks along the way.

This memorandum compiles process outcomes and major products that resulted from the Alternatives Analysis. Seven (7) alternative routes were analyzed with respect to the project evaluation criteria described in *Technical Memorandum #1: Policy Framework and Alternatives Analysis Selection Criteria*. The purpose of the Alternatives Analysis process was to determine the route(s) to be advanced to subsequent stages of the Monroe Neighborhood Design Project, including early conceptual design.

Alternatives Analysis Matrix

Monroe Neighborhood Street Design Plan: Alternatives Analysis Table - 11/2/2015

			Alternative Routes							
Evaluation Criteria	**Sub-Criteria**	**Performance Measure**	**Alternative 1A:** Monroe Street – Boyer Drive (Extended) – 85th Ave – Spencer Drive (Monroe Gap closed to traffic)	**Alternative 1B:** Monroe Street – Boyer Drive (Extended) – 85th Ave – Spencer Drive (Monroe Gap open to traffic)	**Alternative 2:** Monroe Street – Fuller Road – Causey Avenue	**Alternative 3:** Monroe Street – Maplehurst Road/Harmony Drive – Causey Avenue	**Alternative 4:** Monroe Street – Maplehurst Road/Harmony Drive – Fuller Road – Boyer Drive (Extended) – 85th Ave – Spencer Drive	**Alternative 5:** Monroe Street – Thompson Road – Fuller Road – Boyer Drive (Extended) – 85th Ave – Spencer Drive	**Alternative 6:** Monroe Street – Thompson Road – Fuller Road – Causey Avenue	**Alternative 7:** Monroe Street – Maplehurst Road/Harmony Drive – Fuller Road– Monterey Ave
Improve safety for all modes, with emphasis on bicycle/pedestrian safety	Reduce and/or avoid bicycle and pedestrian safety hazards	*Potential to reduce the number of difficult intersection crossings and high-speed environments*	●	●	◑	○	○	◑	○	○
	Reduce conflicts among all modes	*Improvement provides physical separation between modes (including at intersections)*	◑	◑	○	○	○	●	◑	○
	Create a calmer street environment	*Potential of improvement to improve neighborhood livability by lowering traffic speeds and/or volumes*	●	○	◑	◑	◑	◑	◑	◑
			8	6	5	4	4	7	5	4
Support healthy and active communities	Improve the pedestrian network	*Proposed design increases sidewalk connectivity and provides safe pedestrian crossings*	●	●	◑	○	○	●	○	○
	Improve the bicycle network	*Proposed design creates continuous and direct bicycle connections between existing and proposed bicycle facilities*	●	●	◑	◑	◑	◑	◑	○
	Decrease noise	*Potential for improvement to decrease vehicle noise within 500 feet of the study area*	◑	○	◑	◑	◑	◑	◑	◑
	Provide access to essential destinations	*Proposed design provides safe bicycle and pedestrian access to essential destinations*	●	●	◑	◑	◑	●	◑	◑
			11	10	8	7	7	10	7	6
Provide safe routes to school	Slow traffic adjacent to Whitcomb Elementary School	*Potential of improvement to reduce traffic speeds on streets within half a mile of Whitcomb Elementary*	○	◑	○	○	○	●	●	○
	Provide safer and direct pedestrian access	*Completeness of sidewalk and path network within a half mile of Whitcomb Elementary; addresses School District-identified hazards*	●	●	◑	◑	◑	●	●	◑
	Provide safer and direct bicycle access	*Completeness of bikeway network within a half mile of Whitcomb Elementary; addresses School District-identified hazards*	●	●	◑	◑	◑	●	●	◑
			7	8	5	5	5	9	9	5
Provide neighborhood benefits and minimize negative impacts	Provide stormwater management	*Potential for "green street" stormwater management features*	●	◑	●	○	○	◑	◑	○
	Avoid right-of-way/encroachment impacts	*Extent of right-of-way impacts and impacts on right-of-way encroachments*	○	○	○	◑	○	◑	◑	●
	Avoid parking impacts	*Number of parking spaces that would be removed with installation of new facilities*	◑	◑	○	◑	●	○	○	●
	Reduce cut-through traffic on Monroe St.	*Assessment of whether the proposed design reduces cut-through traffic on Monroe Street*	●	○	◑	○	○	○	○	○
	Improve motor vehicle system	*Potential to increase motor vehicle connectivity; potential to address identified motor vehicle safety hazards*	○	●	○	○	○	◑	◑	◑
			10	9	8	7	7	8	8	10
Create an implementable project plan	Feasibility	*Extent of ROW purchases, physical barriers, ownership issues, and funding source availability*	●	●	●	◑	◑	●	●	◑
	Capital cost	*Level of needed investment to complete route*	●	◑	○	○	○	◑	○	◑
	Maintenance cost (ongoing)	*Alternative aligns well with current or potential future funding and financing sources*	◑	●	◑	●	●	◑	◑	●
			8	8	5	6	6	7	6	7
		PERFORMANCE SCORE	**44**	**41**	**31**	**29**	**29**	**41**	**35**	**32**

Alternatives Analysis Process Methodology

MEMORANDUM

Monroe Neighborhood Street Design Plan Alternative Analysis: Methodology Summary

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From: Catherine Ciarlo, CH2M Project Manager
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Date: 11/2/2015

Introduction

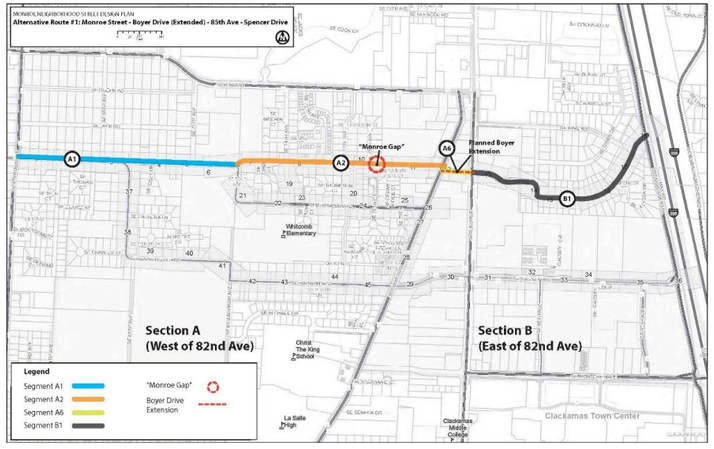
This memorandum is a summary of project team activities to develop an analysis of alternatives for the Monroe Neighborhood Street Design in Clackamas County. This document is intended to be an internal compilation of technical information used during the evaluation process. It is not meant to be an externally-facing Alternatives Analysis Report.

Overview of Alternative Routes

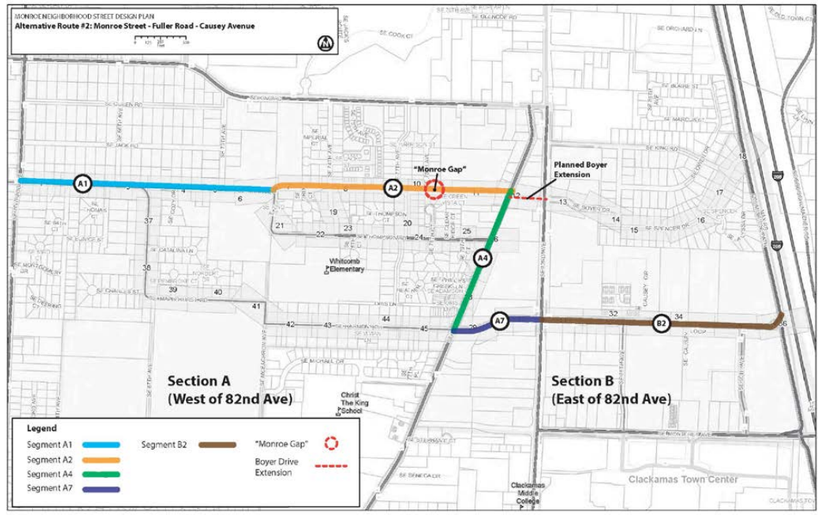
Maps of each alternative route are included below. Written descriptions of each route can be found in the alternative analysis cut sheets, or Technical Memorandum #2: Needs, Constraints, and Potential Solutions.

Alternative 1: Monroe Street – Boyer Drive (Extended) – 85th Ave – Spencer Drive

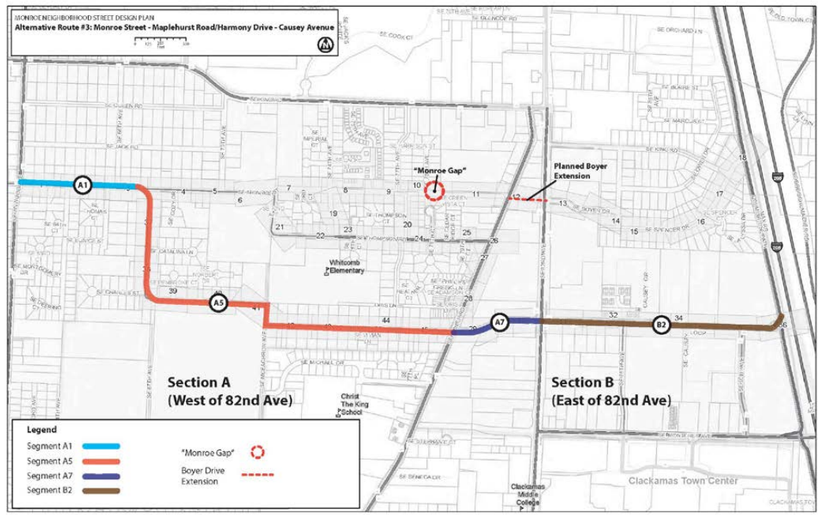
- *Design Option (a): Monroe Gap improved as an exclusive bicycle/pedestrian facility*
- *Design Option (a): Monroe Gap improved to local street standards (vehicle access).*



Alternative 2: Monroe Street – Fuller Road – Causey Avenue

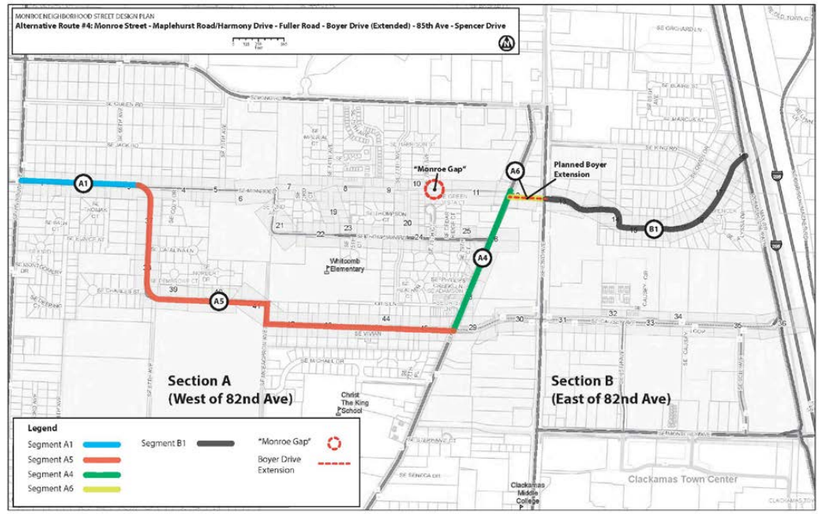


Alternative 3: Monroe Street – Maplehurst Road/Harmony Drive – Causey Avenue

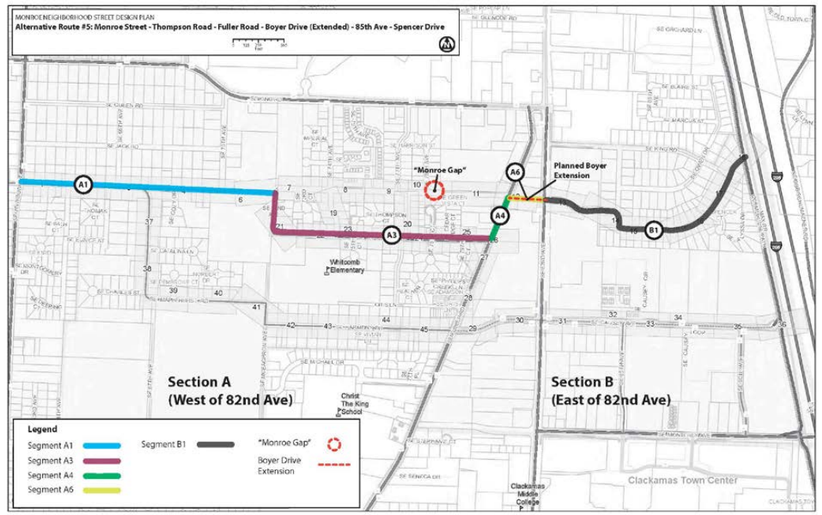


MONROE NEIGHBORHOOD STREET DESIGN PLAN ALTERNATIVE ANALYSIS: METHODOLOGY SUMMARY

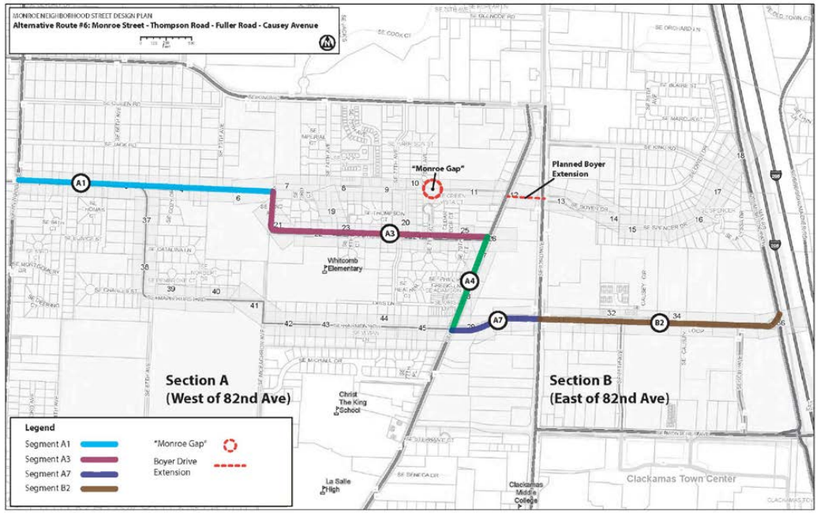
Alternative 4: Monroe Street – Maplehurst Road/Harmony Drive – Fuller Road – Boyer Drive (Extended) – 85th Ave – Spencer Drive



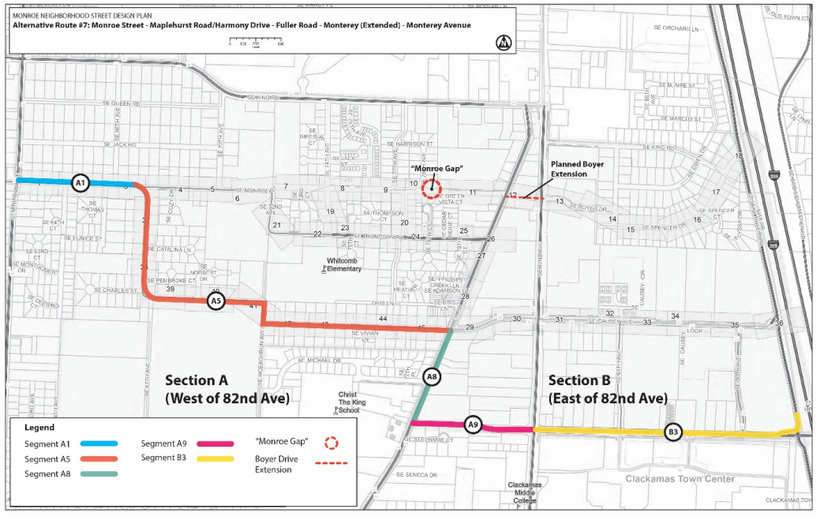
Alternative 5: Monroe Street – Thompson Road – Fuller Road – Boyer Drive (Extended) – 85th Avenue – Spencer Drive



Alternative 6: Monroe Street – Thompson Road – Fuller Road – Causey Avenue



Alternative 7: Monroe Street – Maplehurst Road/Harmony Drive – Fuller Road - Monterey Avenue



Key Findings

The project team noted the following key findings in the process of evaluating the Route Alternatives against the approved evaluation criteria:

- Reflecting concerns raised at past TAC, PAC, and PMT meetings, the Safe Routes to School (SRTS) criteria had an important influence on the performance outcomes of alternative routes. Generally, alternatives determined to *not* offer direct SRTS benefits did not perform as well as those that did.
- Alternatives 1(a) was the highest-performing route under the evaluation criteria. Alternatives 1(b) and 5 (Thompson) were tied as the second highest-performing routes under the evaluation criteria. Alternative 1(a) performed particularly well under bicycle and pedestrian safety, supporting healthy and active communities, providing neighborhood benefits, and implementation criteria. Alternative 5 performed substantially better than Alternative 1(a) well under SRTS criteria, but not as well as 1(a) under other evaluation criteria.
- All of the routes performed better by improving the Monroe Gap under design option (a). It was determined that allowing automobile access between 78th and 82nd Avenues deteriorated the performance of all of the routes in question – therefore, all the routes were evaluated under the assumption that the gap would be improved as an exclusive bicycle/pedestrian facility. It was also determined that diversion at Linwood Ave. and Monroe St. significantly improved the performance of each of the routes under consideration, as through-traffic along Monroe lowered route performance.
- Alternatives 3 and 4 (Causey & Maplehurst/Fuller) were tied for the lowest-performing route. These routes performed poorly with respect to improving the pedestrian network, mostly due to lengthy out-of-direction travel and the diversion of active transportation users to higher-speed, higher volume roads.
- Routes incorporating travel along Fuller Road did not perform as well as those that did not. The reasons why include safety concerns (high-speed, high-volumes), west-bound backtracking if travelling south on Fuller Road, higher costs due to increased signalization needs, and poor improvement to the bicycle/pedestrian network.
- Generally, routes that propose new investments in areas currently not planned for bicycle and pedestrian improvements fared better than those that did not.
- Alternative 7 (Monterey) did not perform as well as four other routes due to safety and access issues at Monterey and the I-205 Multi-Use Path access point. Alternative 7 also did not perform well with respect to improving the bicycle network given that improvements for Monterey are already planned, funded, and underway.
- Generally, alternative routes with good north-south access to the I-205 Multi-Use Path performed better than those that did not.

Alternative Analysis early outcomes and next steps

- Alternatives 1(a) was the best-performing route under the evaluation criteria.
- The performance scores are a qualitative measure of how each alternative performed under the project evaluation criteria. They are not intended to make a definitive route selection, but to reveal trade-offs and inform choices regarding the preferred option (or options).
- The Alternatives Analysis report for the Monroe Neighborhood Street Plan will consist of the completed Evaluation Matrix and a cut sheet for each route alternative that includes cross

sections, benefits and challenges, and other key information to inform the decision about a preferred route.

- The PMT will convene on October 29, 2015 to discuss the alternative analysis findings and identify a proposed preferred alternative for the Monroe Neighborhood Street Design Plan.

Methodology – process and background information

Evaluation criteria revisions

As the project team began the process of applying the Evaluation Criteria described in TM#1 to the seven route alternatives, it became clear that one criterion and several of the performance measures needed some level of revision to allow for practical application to the physical route alternatives. A complete list of these revisions -- including a brief justification for each revision – is listed below.

Evaluation criterion revision:

Reduce cut-through traffic

- Was moved to the 'Provide neighborhood benefits and minimize negative impacts' category from the 'Improves safety for all modes, with an emphasis on bicycle/pedestrian safety.'
- **Justification:** Although reducing cut-through traffic on Monroe is being generally considered as a safety improvement for all modes, such an improvement is more consistent with minimizing neighborhood benefits, as residents along Monroe, cyclists, and pedestrians using the corridor alike have expressed concern about non-local traffic cutting through the neighborhoods along Monroe.

Performance measure revisions:

Potential to reduce the number of difficult intersection crossings and high-speed environments

- **Justification***:* This performance measure was revised to more closely align with the *hazards* criterion under the evaluation criteria. Intersections are emphasized as locations where modes frequently conflict, heightening potential hazards. Although intersections are emphasized, the performance measure preserves language around vehicle speeds, as high-speed environments are also considered to be hazardous.

Improvement provides physical separation between modes (including at intersections)

- **Justification:** The original performance measure included language to include the use of signage and/or markings to guide user behavior; this language was removed given that most, if not all, of the alternatives under consideration would include some application of signage and/or markings to create a safer street environment for all modes.

Proposed design creates continuous and *direct* bicycle connections between existing and proposed bicycle facilities.

- **Justification:** Directness was absent from the original evaluation criteria; during the alternatives analysis activity, it was determined that including a measure of directness would be an important consideration in grading the alternative routes. In addition, all of routes were considered to do a fair job of serving 'essential destinations', although they did not all perform relatively well with respect to connect to existing and proposed bicycle facilities.

Completeness of sidewalk and path network *within a half-mile* of the school; addresses School District-identified hazards

- **Justification:** A more specific measure (within a half-mile) was used in place of the original (more vague) language, which read 'school vicinity.'

Completeness of bikeway network *within a half-mile* of the school; addresses School District-identified hazards

- **Justification:** A more specific measure (within a half-mile) was used in place of the original (more vague) language, which read 'school vicinity'.

Extent of ROW purchases or physical barriers

- **Justification:** 'Natural' barriers were removed, as the foremost issues have to do with man-made barriers (such as front yards and adjunct parking). 'Ownership issues' was removed because encroachment is the real issue – county ownership issues are already captured in 'extent of ROW purchases.'

Level of needed investment to complete route

- **Justification:** The original performance measure read, "Alternative aligns well with current or potential future funding and financing sources." This was deemed a secondary consideration to the general cost of the given improvement.

Application of the evaluation criteria to the alternative routes

Using the segments that constitute each of the alternative routes as an analysis framework, the consultant team discussed each route with respect to the revised evaluation criteria. General notes on the discussion -- organized by alternative route -- are provided below:

Alternative 1: Monroe Street – Boyer Drive (Extended) – 85th Ave – Spencer Drive

- *Design Option (a): Monroe Gap improved as an exclusive bicycle/pedestrian facility*
- *Design Option (a): Monroe Gap improved to local street standards (vehicle access)*

  - Alternative 1(a) was the best-performing routes under consideration.
  - A global consideration for all alternatives is with regard to the intersection of Linwood Avenue and Monroe Street. This intersection will require safety improvements to create an active transportation corridor along Monroe Street east of Linwood Avenue.
  - Design option (a) performed considerably better than design option (b). One of the benefits for design option (a) is the increased opportunity to incorporate stormwater treatment features into the neighborhood street design.
  - Design option (a) performed better with respect to capital cost than any other alternative route.
  - Design option (b) performed worse in several areas, including creating a calmer street environment and limiting cut-through traffic on Monroe Street. Design option (b) was also the only route alternative of the seven that is anticipated to make noise levels *worse* along Monroe Street. All other alternatives are anticipated to have no impact on current noise levels.
  - Alternative 1 generally did not perform well with respect to providing safe routes to school, since they would not produce direct improvements within the vicinity of Whitcomb Elementary. Alternative 1 would, however, provide benefits within the vicinity of Sojourner Elementary.
  - Design option (a) did poorly with respect to slowing traffic adjacent to Whitcomb Elementary, as vehicles would be diverted to Thompson and Maplehurst if traveling eastbound, given no vehicle access at the Monroe Gap.
  - Design option (b) performed better than design option (a) with respect to slowing traffic adjacent to Whitcomb Elementary, as new access from Monroe to 82nd Avenue is expected to decrease vehicle volumes along Thompson Road.

- Alternative 1 scored well for having a central location to both MAX stations along the I-205 Multi-Use Path, for general directness, and for bringing the greatest improvement to the bicycle and pedestrian network.
- Work on Monroe could be extensive. There is not room for bike lanes and parking – design option (a) would comprise a neighborhood greenway treatment with a side path ($). Design option (b) would comprise a shared use path with queue street (more $). Work should include realignment of Maplehurst.
- Constructing shared use path in gap – less expensive than signal (only reason this is $ and Alt 5 is $$)
- Additional cost considerations include basic signing and striping, and perhaps some speed cushions east of 85th.

Alternative 2: Monroe Street – Fuller Road – Causey Avenue

- Alternative 2 and all subsequent alternative routes assume that the Monroe Gap is improved as an exclusive bicycle/pedestrian facility.
- Alternative 2 was considered to have difficult crossings and high vehicle speeds along Fuller Road. Given these challenges, significant improvements would have to be made to Fuller in order to bring it up to adequate standards for a bicycle/pedestrian friendly facility.
- Benefits to the Fuller Road segment include exiting bicycle lanes and under-utilized parking space – these features present an opportunity to re-allocate road space to better accommodate Neighborhood Street users.
- It is likely that signalized crossings would be necessary to create safer crossings at Fuller's intersections. The addition of signalization does present additional cost considerations, although the final design would substantially improve Fuller Road for all road users.
- Cost considerations include greenway improvements along Monroe Street, signals at Fuller Road, and improvements along Causey including restriping, sidewalk repair, and speed cushions.

Alternative 3: Monroe Street – Maplehurst Road/Harmony Drive – Causey Avenue

- Alternative 3 includes five (5) difficult crossings and performed poorly with respect to reducing and/or avoiding bicycle and pedestrian safety hazards.
- Alternative 3 does a slightly better job of improving the bicycle network than the pedestrian network – this is mostly because of out-of-direction travel that is not highly feasible on-foot.
- Alternative 3 performed poorly with respect to minimizing parking impacts along Causey.
- Maplehurst Road/Harmony Drive is currently well-traveled by automobiles. Bicycle and pedestrian improvements along Maplehurst Road/Harmony Drive are not expected to yield direct benefits for drivers.
- Cost considerations would include the same Monroe Street greenway improvements, the realignment of the Maplehurst intersection, realignment at Fuller/Harmony/Causey, and the addition of signals. Maplehurst would include sharrows and improved pedestrian facilities.

Alternative 4: Monroe Street – Maplehurst Road/Harmony Drive – Fuller Road – Boyer Drive (Extended) – 85th Ave – Spencer Drive

- Alternative 4 performed was the worst-performing out of the seven routes under consideration.
- Alternative 4 performed very well with regard to minimizing parking impacts.

- Cost considerations would include the greenway improvements along Monroe Street, the realignment of the Maplehurst intersection, realignment at Fuller/Harmony, and the addition of signals. Maplehurst would include sharrows and improved pedestrian facilities.
- Additional cost considerations would include signals at Fuller Road as well as signing, striping, and speed cushions east of 85th Avenue.
- Alternative 4 presents a U-shaped network path and significant out-of-direction travel.
- A left-turn and then significant travel along Fuller Road scored this alternative poorly with respect to avoiding/reducing bicycle/pedestrian hazards, modal conflicts, and improving the motor vehicle system.

Alternative 5: Monroe Street – Thompson Road – Fuller Road – Boyer Drive (Extended) – 85th Avenue – Spencer Drive

- Alternative 5 and Alternative 1(a) were the best-performing routes under consideration (tied).
- Alternative 5 was one of the best-performing routes with regard to providing safe routes to school.
- Alternative 5 achieved the most balanced performance with respect to providing neighborhood benefits of any of the routes under consideration.
- Alternative 5 performed better than any of the other routes under consideration with respect to reducing conflicts among all modes.
- The only criterion under which Alternative 5 performed poorly was 'reduce cut-through traffic'.

Alternative 6: Monroe Street – Thompson Road – Fuller Road – Causey Avenue

- Alternative 6 was one of the best-performing routes with regard to providing safe routes to school. It performed strongly in all three of the sub-criteria under the SRTS category.
- Alternative 6 was not determined to improve the pedestrian network, primarily due to out-of-direction travel associated with a z-shaped network path.
- Alternative 6 performed poorly with respect to minimizing parking impacts along Causey Avenue.
- This alternative performed poorly with respect to minimizing/avoiding bicycle/pedestrian hazards, primarily due to travel along Fuller Road, a left-turn onto Causey, and a high potential for modal conflicts east of 82nd Avenue.
- Alternative 6 also performed poorly with respect to minimizing cut-through traffic along Monroe Street.
- Cost considerations include two signalized intersections on Fuller.

Alternative 7: Monroe Street – Maplehurst Road/Harmony Drive – Fuller Road - Monterey Avenue

- Alternative 7 performed very well with regard to minimizing parking impacts and avoiding right-of-way/encroachment impacts.
- Alternative 7 does an exceptionally good job of providing direct access to the Clackamas Town Center. It also does a good job of leveraging planned improvements for Monterey (including full build-out of the street between Fuller Road and 82nd Avenue). Alternative 7 did not, however, perform well with respect to *improving* the bicycle/pedestrian system, since improvements along Monterey are already planned and funded.

- Safety concerns for this alternative include traffic volumes/speeds along Maplehurst Road and Fuller Road. In addition, the wide turning-radii at Maplehurst @ Monroe and Maplehurst @ 72nd and dangerous and would potentially require mode separation and turn realignment.
- East-bound cyclists wishing to access the I-205 Multi-Use Path must cross Monterey to get to the access point on the north-side of the street – this poses potential safety concerns and likely investments (such as rapid-flash beacons) to make crossing Monterey at the I-205 bicycle/pedestrian access point safer for active transportation users.
- Alternative 7 did not perform well with respect to supporting healthy and active communities, primarily due to significant out-of-direction travel, lengthy travel along Fuller Road, the crossing of several dangerous intersections, and a south-bound orientation.
- Cost considerations include a signalized intersection at Harmony/Fuller, as well as configuration issues with access to the I-205 Multi-Use Path.

Alternatives Analysis Cut-Sheets

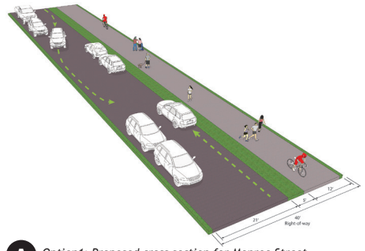
MONROE STREET NEIGHBORHOOD DESIGN PLAN

Alternative Route #1A: Monroe Street - Boyer Drive (Extended) - 85th Ave - Spencer Drive

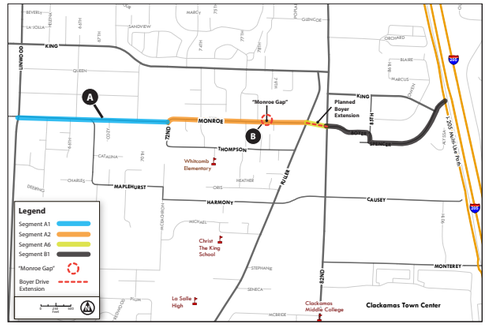
Monroe Gap improved for bicycles and pedestrians only

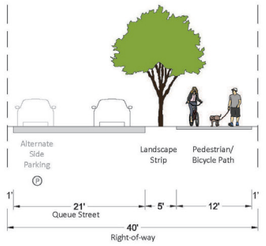
Alternative Route #1A runs along Monroe Street from SE Linwood Avenue to 82nd Avenue, then follows Boyer Drive, 85th Avenue and Spencer Drive to the I-205 Multi-Use Path. This alternative assumes the "Monroe Gap" is improved to provide pedestrian and bicycle-only access.

This is the shortest and most direct connection of all the alternatives being considered. It assumes construction of the planned Boyer Drive extension between Fuller Road and 82nd Avenue.

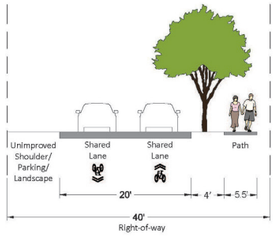


A *Option1: Proposed cross section for Monroe Street, Linwood to 72nd Avenue*





A *Option 1: Proposed cross section for Monroe Street, Linwood to 72nd Avenue (bike/ped path)*

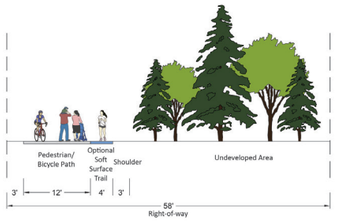


A *Option 2: Proposed cross section for Monroe Street, Linwood to 72nd Avenue (ped only path)*

Alternative Analysis Highlights

- Alternative #1A has greater potential to reduce difficult intersections and high-speed environments than other alternatives
- This route offers good access for both northbound and southbound bicycle riders on the I-205 Multi-Use Path
- Pedestrian safety is improved with a path on one side of the street
- Parking is preserved to create a "queuing street"

Path example from Gresham, OR



B *Shared-use path option for the "Monroe Gap"*

Safe Routes to School

- Alternative Route #1A does not pass directly by Whitcomb Elementary School, so it does not result in the adjacent safety improvements provided by some alternatives
- Monroe Street from Linwood Avenue to Maplehurst Road is within the Linwood Sojourner Elementary School hazard zone; pedestrian improvements on Monroe would help improve safety in that zone

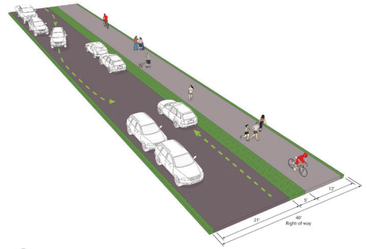
MONROE STREET NEIGHBORHOOD DESIGN PLAN

Alternative Route #1B: Monroe Street - Boyer Drive (Extended) - 85th Ave - Spencer Drive

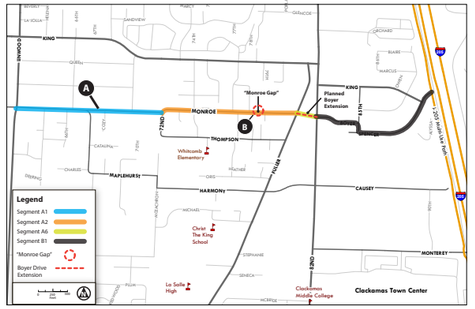
Full Build-out of Monroe Gap for autos

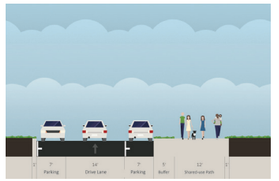
Alternative Route #1B runs along Monroe Street from SE Linwood Avenue to 82nd Avenue, then follows Boyer Drive, 85th Avenue and Spencer Drive to the I-205 Multi-Use Path. This alternative includes motor vehicle, bicycle, and pedestrian access through the "Monroe Gap."

This is the shortest and most direct connection of all the alternatives being considered. It assumes construction of the planned Boyer Drive extension between Fuller Road and 82nd Avenue.

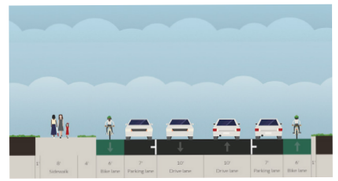


A *Proposed cross section for Monroe Street, Linwood to 72nd Avenue*





A *Proposed cross section for Monroe Street, Linwood to 72nd Avenue (bike/ped path)*

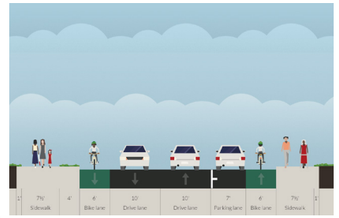


B *Full build-out option for the "Monroe Gap"*

Alternative Analysis Highlights

- This route offers good access for both northbound and southbound riders on the I-205 Multi-Use Path
- Alternative #1B is lower-performing than Alternative #1A with regard to creating a calmer street environment because it would increase vehicular traffic on Monroe Street
- Higher speeds and volumes require separated bicycle accomodations

Bike lane example from Milwaukie, OR

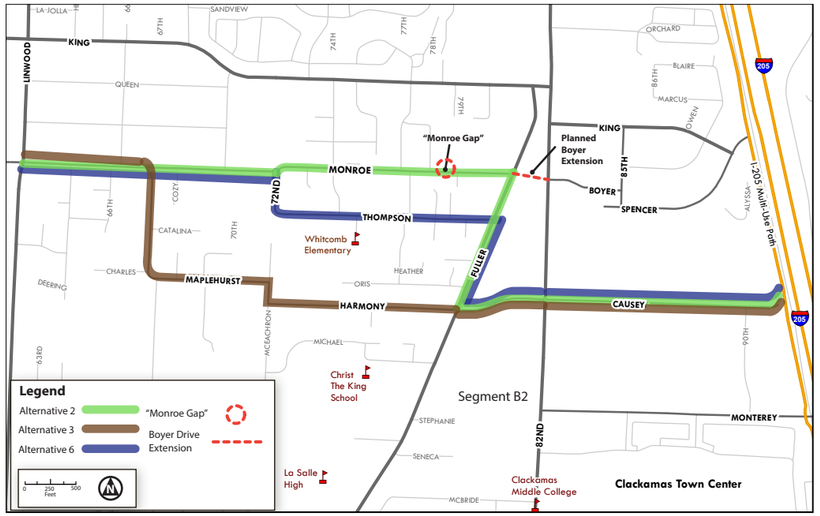


C *Proposed cross section for Monroe Street, 72nd Avenue to Boyer*

Safe Routes to School

- While Alternative Route #1B does not pass directly by Whitcomb Elementary School, it has the potential to draw motor vehicles away from Thompson Road where Whitcomb Elemntary is located
- Monroe Street from Linwood Avenue to Maplehurst Road is within the Linwood Sojourner Elementary School hazard zone; pedestrian improvements on Monroe Street would help improve safety in that zone

Fuller Road & Causey Avenue - Constraints and Challenges

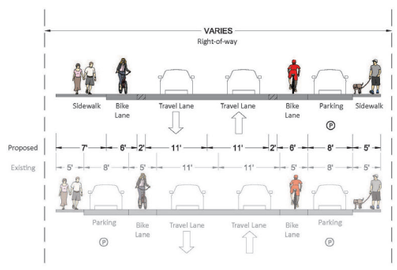


Fuller/Causey Intersection

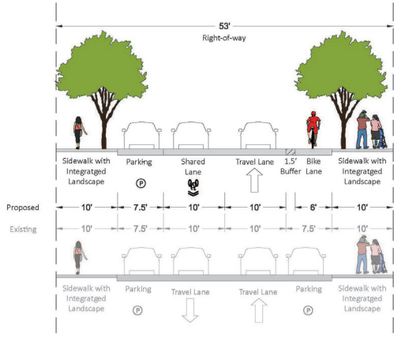
- A signalized crossing is needed for safe pedestrian and bicycle movement at the intersection of Fuller and Causey; this would add significant cost to alternatives utilizing the Fuller/Causey intersection

Fuller Constraints and Challenges

- Fuller is built out to the existing right-of-way, including substandard 5' bike lanes with no buffer. These do not provide an adequate level of comfort and protection for "interested but concerned" riders and families with children. Re-aligning the street to allow space for a protected bikeway requires parking removal on one side



Cross section of Fuller Road, from Thompson Road to Causey Avenue



Cross section for Causey Avenue, between 82nd Avenue and I-205 Multi-Use Path

Causey Constraints and Challenges

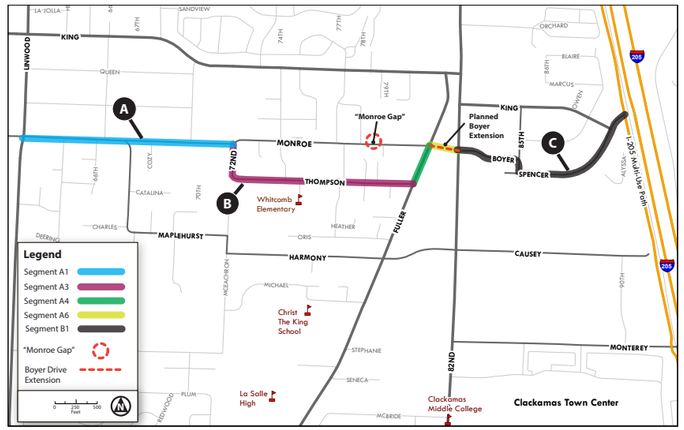
- Speeds, volumes and grade on Causey make uphill bike travel unsafe without a bike lane
- Parking is removed on south side to make space for the bike lane; no bike lane is provided on downhill (north) side because removal of parking on north side would eliminate highly-utilized parking and leave business and residents with no on-street spaces
- Downhill bicycle travel is accommodated in a shared lane, which is acceptable for experienced, confident riders but not desirable due to heavy traffic and conflict with parking
- Downhill shared lane does not serve "interested but concerned" bicyclists or families

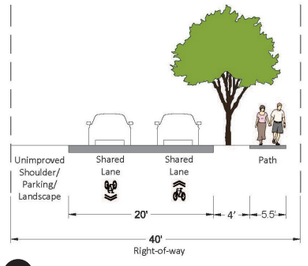
CLACKAMAS COUNTY

MONROE STREET NEIGHBORHOOD DESIGN PLAN

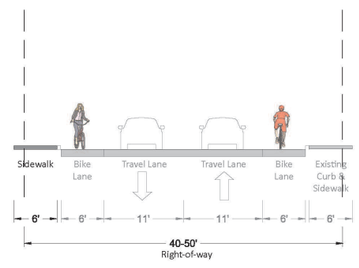
Alternative Route #5: Monroe Street - Thompson Road - Fuller Road - Boyer Drive (Extended) - 85th Ave - Spencer Drive

This route follows Monroe Street between Linwood Avenue and 72nd Avenue, then Thompson Road from 72nd Avenue to Fuller Road, Fuller Road to Boyer Drive, and Boyer Drive to 85th Avenue and Spencer Drive to connect to the I-205 Multi-Use Path. This alternative assumes the extension of Boyer





A *Option 2: Proposed cross section for Monroe Street, Linwood to 72nd Avenue*



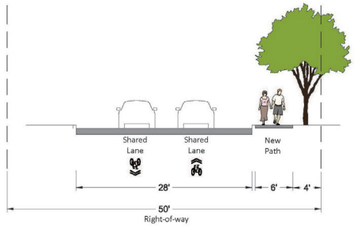
B *Proposed cross section for Thompson Road, from Whitcomb to Fuller (new sidewalk would require additional right-of-way)*

Alternative Analysis Highlights

- This route includes a signal at Thompson Road and Fuller Road
- Alternative #5 could require some right-of-way aquisition to complete sidewalks on both sides of the street
- Providing continuous bike lanes could impact school parking

Safe Routes to School

- Alternative #5 performed well on Safe Routes to School criteria because it is directly adjacent to Whitcomb elementary



C *Proposed cross section for Spencer Drive*

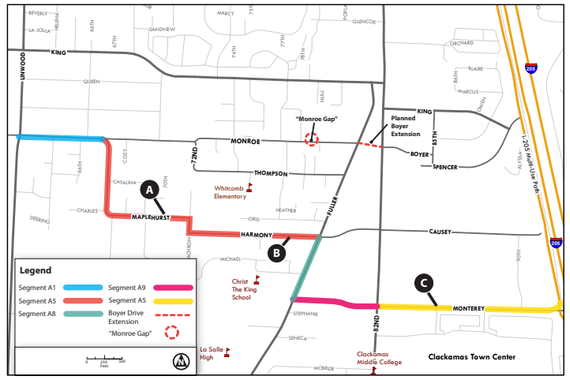
CLACKAMAS COUNTY

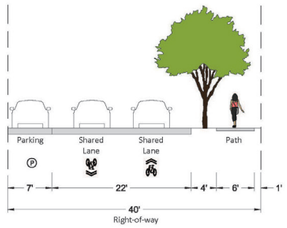
MONROE STREET NEIGHBORHOOD DESIGN PLAN

Alternative Route #7: Monroe Street - Maplehurst Road - Harmony Drive - Fuller Road - Stephanie Court - Monterey Avenue

This route follows Monroe between Linwood Avenue to Maplehurst Road, then follows Maplehurst to Harmony Drive to Fuller Road. The route goes south on fuller and turns onto Stephanie Court, which connects to Monterey Avenue, connecting to the I-205 Multi-Use Path.

This is the least direct route with the greatest number of turns and intersection crossings.





A *Proposed cross section for Maplehurst Road*

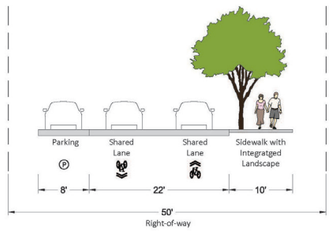
Alternative Analysis Highlights - Maplehurst

- Maplehurst and Harmony require more out-of-direction travel for pedestrians
- Currently, Maplehurst lacks sidewalks and has limited right-of-way
- Improving the existing multi-use path from Maplehurst to Whitcomb Elementary could provide safer walking access to the school

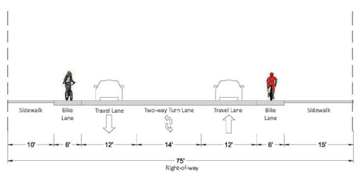
Alternative Analysis Highlights - Harmony & Fuller

- The Harmony/Fuller intersection presents increased conflicts for pedestrians and cyclists
- Widening the bike lane to meet County standards on Fuller Road will require parking removal on one side of the street

See previous cutsheets for more information on Fuller Road



B *Proposed cross section for Harmony Drive*



C *Proposed cross section for Monterey Drive*

Alternative Analysis Highlights - Monterey

- There is currently no direct access for eastbound cyclists on Monterey Avenue to reach the I-205 Multi-Use Path. This route would require installation of a Rectagular Rapid Flash Beacon (RRFB) or High-Intensity Activated Crosswalk (HAWK) beacon to enable cyclists to cross traffic safely when accessing the path
- This route performs worse than others with respect to northbound access for pedestrians or bicyclists traveling north to I-205 Multi-Use Path
- This route requires a lower level of system improvements because the bicycle improvements already exist along Monterey