

Intersections - Aesthetics/User Experience

	#1 - All Asphalt	#2 - Asphalt Center with Concrete Crosswalks	#3 - All Concrete	#4 - Paver Center with Concrete Crosswalks
Textures	D <ul style="list-style-type: none"> No textural quality related to aesthetics/user experience 	C <ul style="list-style-type: none"> Concrete crosswalk provides the minimum variation from the asphalt road Scoring provides some texture 	B <ul style="list-style-type: none"> Scoring of crosswalk and center provides texture Special concrete could provide additional texture to the intersection center (i.e. stamping), still needs to be bike friendly 	A <ul style="list-style-type: none"> Pavers provide an additional interesting texture through visual and tactile pattern to the intersection center
Colors	C- <ul style="list-style-type: none"> Basic black after construction 	B- <ul style="list-style-type: none"> Standard 'white' concrete will be a contrast to asphalt Added color options for concrete crosswalks provide vibrancy and variety (over less area in all concrete option) 	B <ul style="list-style-type: none"> Standard 'white' concrete will be a contrast to asphalt roadway Added color options for concrete over asphalt provide vibrancy and variety 	A <ul style="list-style-type: none"> Provides an additional interesting visual texture through color and pattern to the intersection centers Color options Multiple colors create pattern
Smoothness – Noise – Ride comfort (cars/bikes) – Walkability (peds in crosswalks)	A <ul style="list-style-type: none"> Very smooth surface Rating will drop as it ages and gets rutted No transitions between roadway and intersection 	A- <ul style="list-style-type: none"> Smooth surface Two joint transitions at crosswalk can create uneven surfaces Concrete crosswalk must be smooth texture for accessibility Joint transitions between material types can create uneven surfaces Crosswalk will have joints and scoring 	A- <ul style="list-style-type: none"> Bike friendly Smooth surface, unless a textured finish is added to the intersection center One joint transition at crosswalk can create uneven surfaces Concrete crosswalk must be smooth texture for accessibility Will have joints and scoring 	B <ul style="list-style-type: none"> Intersection center may be bumpier for bicyclists. Intersection center not as smooth as asphalt or concrete options Concrete crosswalk must be smooth texture for accessibility Joint transitions between material types can create uneven surfaces
Long-term appearance – Aging – Tire marks – Repairs (partial, not whole intersection)	B <ul style="list-style-type: none"> No special aesthetic quality Will rut and spall Turns grey soon Doesn't show tire marks Asphalt patches can be unsightly 	B- <ul style="list-style-type: none"> Asphalt in the center can age more quickly than the concrete crosswalk White concrete turns grey in time, patina, less contrast to asphalt as it ages Color concrete fades in time Tire wear marks/ruts show up over time in concrete crosswalks, i.e. Lake Oswego A Street Tire marks show up on concrete soon after construction (depending on color) Asphalt patches can be unsightly 	B <ul style="list-style-type: none"> White concrete turns grey in time, patina, less contrast to asphalt as it ages Color concrete fades in time Tire wear marks/ruts show up over time in concrete. Tire marks show up on concrete soon after construction (depending on color) Repairs not as noticeable if concrete is sawcut at joints New concrete patch color will be different 	A- <ul style="list-style-type: none"> Minimal color fade for pavers Chipping of at corners of pavers may happen shows up soon after construction depending on color Repairs noticeable if pavers need to be replaced due to chipping or cracking Repairs not noticeable if existing pavers can be re-used
Meeting LGVCP goals	D <ul style="list-style-type: none"> No variation in materials from the rest of roadway 	B <ul style="list-style-type: none"> Meets the minimum requirements Basic treatment to differentiate the intersections to make them special 	A- <ul style="list-style-type: none"> Basic treatment to differentiate the intersections to make them special Provides some opportunities for creativity and design options in the center Center could have additional texture, but still needs to be bike friendly 	A <ul style="list-style-type: none"> Better treatment to differentiate the intersections to make them special Provides the most opportunities for creativity and design options in the center Paver center provides texture

RATINGS

- A** Best
- B** Okay
- C** Not very good
- D** Poor

Intersection Constructability

	#1 - All Asphalt	#2- Asphalt Center with Concrete Crosswalk	#3- All Concrete	#4- Paver Center with Concrete Crosswalks
Description	<ul style="list-style-type: none"> Most of the intersection will be constructed within same staging concept for roadway construction The rest of the intersection could be built using night lane closures 	<ul style="list-style-type: none"> Crosswalk on Boones Ferry Road will be constructed within same staging concept for roadway construction. Adds time over All Asphalt option for concrete placement and building with two materials. Additional stages required to build the crosswalks on cross streets. Week-long lane closures may be required. 	<ul style="list-style-type: none"> Portion of the intersection could be constructed at same staging concept for roadway construction; Additional stages will be required to build the rest of the intersection. Partial closure may be required Week-long lane closures may be required due to added steps for concrete construction and curing 	<ul style="list-style-type: none"> Need same staging (and possible partial closure) to build concrete base as concrete pavement All pavers need to be laid out and installed at the same time, full intersection closure is required. (Because pavers will move under live traffic when the intersection is not fully done). Week-long lane closures may be required due to added stops for concrete construction and curing.
Staging	A	C+	C	D
	<ul style="list-style-type: none"> Easiest to build, baseline condition Up to 4 traffic shifts/night time lane closures required per intersection 	<ul style="list-style-type: none"> Up to 3 additional stages required to build the crosswalks on cross streets. Some cross street turn movement or approaches may need to be closed. 	<ul style="list-style-type: none"> Requires up to 5 extra stages, traffic will be shifted many times, and this will impact the consistency of product. Option: Partial intersection closures on weekends (with detours) would reduce number of stages. 	<ul style="list-style-type: none"> Requires up to 5 extra stages, traffic will be shifted many times (<i>same as all concrete option</i>), Option: Partial intersection closures on weekends (with detours) would reduce number of stages. Requires one weekend total closure to install the pavers.
Traffic and business impacts	A	B	C	D
	<ul style="list-style-type: none"> Easiest to build, baseline condition can be built under similar staging to overall project 	<ul style="list-style-type: none"> Additional stages shifting traffic on cross streets. Up to 30 more calendar days for construction (mainly for staging and concrete curing) 	<ul style="list-style-type: none"> Additional stages shifting traffic at intersections. Up to 50 more calendar days for construction (mainly for staging and concrete curing). 	<ul style="list-style-type: none"> Additional stages shifting traffic at intersections. Up to 50 more calendar days for construction (mainly for staging and concrete curing). One weekend closure for each intersection.
Road closure	A	B+	C	D
	<ul style="list-style-type: none"> Lane closures at night only. No full intersection closures. 	<ul style="list-style-type: none"> No full intersection closures. Week-long lane closures may be required. Some cross street turn movement or approaches may need to be closed. 	<ul style="list-style-type: none"> Possible full intersection closure. Week-long lane closures may be required. Closing cross streets on weekends would speed up construction. 	<ul style="list-style-type: none"> Full intersection closure for installing pavers. Week-long lane closures may be required. Closing cross streets on weekends would speed up construction.
Impact to private property entrances	A	A	B	D
	<ul style="list-style-type: none"> No additional impacts 	<ul style="list-style-type: none"> No additional impacts 	<ul style="list-style-type: none"> East driveway at Madrona St. intersection may need to be closed for one weekend or partially closed for two weekends East and west driveways at McDonald's intersection may need to be partially closed for two weekends Other business may be detoured as well if intersection closure is allowed. 	<ul style="list-style-type: none"> East driveway at Madrona St. intersection will be closed one weekend for paver installation, additional closure may be needed for concrete base. East and west driveways at the McDonald's intersection will be closed one weekend for paver installation, additional closures may be needed for concrete base. Adjacent businesses will be impacted every time an intersection is closed.

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Intersections - Cost

	#1 - All Asphalt	#2 - Asphalt Center with Concrete Crosswalks	#3 - All Concrete	#4 - Paver Center with Concrete Crosswalks
Construction Cost for the Four Signalized Intersections	\$320,000	\$430,000	\$650,000	\$1,420,000
Lifecycle costs (maintenance, rehabilitation/replacement) (3,504 SY Total)	A Will require continued maintenance over life. Roughly \$60/SY over 40 years	B+ Durable, low maintenance with higher cost. Roughly \$70/SY over 40 years	B Very durable, low maintenance with higher cost. Roughly \$90/SY over 40 years	C Unknown, but ongoing maintenance has been highly problematic
Sustainability (green ratings)	100% recyclable, but information not available or hard to evaluate for other factors.	100% recyclable, but information not available or hard to evaluate for other factors.	100% recyclable, but information not available or hard to evaluate for other factors.	100% recyclable, but information not available or hard to evaluate for other factors.
Repairs Project is replacing: <ul style="list-style-type: none"> • Some water • Storm drain Project is not replacing: <ul style="list-style-type: none"> • Sewer • LGWD water Likelihood of major repairs is small.	A Rating is based on an extensive repair scenario where a utility line under the intersection needs to be replaced, the following steps must be done: <ul style="list-style-type: none"> • Traffic staging required • Sawcut and remove asphalt • Excavate base rock and subsoil • Repair utility • Replace subsoil and base rock • Repave asphalt surfacing • Traffic staging removed within hours after asphalt placement 	B- Rating is based on an extensive repair scenario where a utility line under the intersection needs to be replaced, the following steps must be done: <ul style="list-style-type: none"> • Traffic staging required • Sawcut and remove concrete and asphalt paving • Excavate base rock and subsoil • Repair utility • Replace subsoil and base rock • Construct portion of concrete crosswalk removed • Cure concrete , assume 28 days • Repave asphalt surfacing after curing • Traffic staging removed within hours after asphalt placement 	B Rating is based on an extensive repair scenario where a utility line under the intersection needs to be replaced, the following steps must be done: <ul style="list-style-type: none"> • Traffic staging required • Sawcut and remove concrete paving • Excavate base rock and subsoil • Repair utility • Replace subsoil and base rock • Construct portion of concrete crosswalk removed • Cure concrete, assume 28 days • Traffic staging after curing completed 	C Rating is based on an extensive repair scenario where a utility line under the intersection needs to be replaced, the following steps must be done: <ul style="list-style-type: none"> • Traffic staging required • Remove and stockpile pavers • Sawcut and remove concrete sub base • Excavate base rock and subsoil • Repair utility • Replace subsoil and base rock • Construct portion of concrete sub base removed • Cure concrete, assume 28 days for finished concrete at surface • Replace pavers during concrete curing time • Traffic staging removed within hours after curing completed

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Evaluation Notes and Recommendation:

Intersections – Safety

	#1 - All Asphalt	#2 - Asphalt Center with Concrete Crosswalks	#3 - All Concrete	#4 - Paver Center with Concrete Crosswalks
Pedestrian Safety	<p>B</p> <p>Striping provides only contrast between roadway and crosswalk</p>	<p>A</p> <p>Color contrast between concrete crosswalk and asphalt road provides more delineation of the pedestrian zone to the driver</p> <p>Panels may become uneven over time creating trip hazards in crosswalks.</p>	<p>B</p> <p>Panels may become uneven over time creating trip hazards in crosswalks.</p>	<p>A</p> <p>Contrast in color between concrete crosswalk and asphalt road provides more delineation of the pedestrian zone to the driver</p> <p>Panels may become uneven over time creating trip hazards in crosswalks.</p>
Bicycles	<p>A</p> <p>Common road surfacing</p>	<p>A</p> <p>Common road surfacing</p>	<p>A</p> <p>Common road surfacing</p>	<p>A-</p> <p>Panels may become uneven over time, creating a fall hazard</p>
Adverse Weather Conditions	<p>B</p> <p>Striping provides only contrast between roadway and crosswalk</p>	<p>A</p> <p>Color contrast of crosswalk makes it safer for pedestrians</p>	<p>B</p> <p>Depending on materials chosen, less contrast than asphalt with concrete crosswalks</p>	<p>B+</p> <p>Color contrast of crosswalk makes it safer for pedestrians</p> <p>Pavers could be damaged by snow plows</p>
Nighttime Visibility (assume well-maintained striping for all options)	<p>B-</p> <p>Striping provides only contrast between roadway and crosswalk</p>	<p>A</p> <p>Concrete crosswalks will stand out from the asphalt roadway and center portion of the intersection. .</p>	<p>B</p> <p>The overall intersection will stand out from the asphalt roadway.</p>	<p>A</p> <p>The concrete crosswalks will stand out from the adjacent roadway asphalt and intersection pavers.</p>

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