

EXECUTIVE SUMMARY

The purpose of this memo is to describe the potential benefits and impacts of three alternatives for an extension of 200 East to the south in Logan. Alternative 1 (north of the river alternative) proposes an extension of a widened 200 East to the south of 300 South, which would then curve to follow the north side of the Logan River to the west and southwest before turning west to connect with 100 East in line with 400 South. Alternative 2 (cross-river alternative) proposes the extension of a widened 200 East to the south of 300 South over a bridge to be constructed over the Logan River, followed by a curved alignment that crosses 500 South and ultimately connects with 100 East between the northwesternmost building at the Falls at Riverwoods apartment complex and the Central Milling office building, possibly in line with the intersection of 80 East with 100 East. Alternative 3 (minimal action alternative) proposes no extension of 200 East to the south with improvements to the intersections of 100 East and 200 East with 300 South, as well as potential widening of the block of 300 South between 200 East and 100 East (Map 1).

Benefits and impacts of these three Alternatives have been considered with respect to the following resources:

- Traffic Issues
- Costs
- Logan River and Riparian Zone
- Open Space Resources
- Wildlife and Habitat Resources
- Recreation and Visual Resources
- Agricultural Resources
- Residential Resources
- Municipal Issues

A more detailed discussion of each resource and the potential impacts of the three Alternatives to those resources is presented in the full report, which follows this executive summary.

Almost all of the current transportation plans for Logan City and the CMPO include an extension of 200 East to the south along the Alternative 2 (cross-river alternative) alignment. The information in this document supports the conclusion that there are at least two other Alternatives that would result in significantly fewer impacts to environmental, social, and municipal resources.

Traffic Issues (Maps 1 and 5) - With respect to traffic issues, all of the Alternatives offer the potential for facilitation of north/south traffic flow and amelioration of congestion occurring periodically under current conditions at the intersections of 200 East and 100 East with 300 South. It is not clear that Alternatives 1 and 2 (north of the river and cross-river alternatives, respectively) offer significantly greater potential for improvements over Alternative 3 (minimal action alternative) since both Alternatives 1 and 2 would require a crossing through an intersection at 300 South and a necessary left turn from the extension of 200 East onto 100 East. In addition, the proposed intersection requiring a left turn to travel between the Alternative 2 (cross-river alternative) alignment and 100 East is in a potentially hazardous location on a curve and coincident with a driveway exit from the Falls at Riverwoods apartment complex and 80 East, which provides an exit from the Springhill Suites hotel, the Riverwoods Conference Center, the associated parking garage/lots, and several retail and restaurant businesses.

If the advantages of Alternatives 1 and 2 (north of the river and cross-river alternatives, respectively) relative to current conditions are essentially limited to improved intersections to facilitate a crossing at 300 South and a left turn at 100 East, those same improvements should be possible under Alternative 3 (minimal action alternative) without the costs and impacts associated with construction of additional roadway. Unless there are other demonstrable advantages, Alternatives 1 and 2 would merely relocate the current traffic congestion during heavy traffic periods a few blocks to the south and west without other meaningful benefits.

Alternatives 1 (north of the river alternative) and Alternative 3 (minimal action alternative) connect directly to existing east/west corridors which would facilitate access to the west side of Logan and to other principal north/south corridors including 600 West (Map 5). Alternative 2 (cross-river alternative) connections to east/west corridors and the west side of Logan are much less direct, restricting the potential benefits to traffic flow of this Alternative to only the north/south direction.

Cost Issues – Alternative 3 (minimal action alternative) would be the least expensive alternative. Alternative 1 (north of the river alternative) would be less expensive than Alternative 2 (cross-river alternative) due to shorter roadway length and no requirement to build a bridge over the Logan River.

Logan River and Riparian Zone (Map 2; Photos 1 through 4)– Alternative 3 (minimal action alternative) would not affect the Logan River or riparian zone.

With adequate setbacks between the roadway and the river, installation of trash and oil/grease traps in storm drains, and implementation of riparian restoration/enhancement measures in a currently degraded reach where the roadway parallels the riverbank, Alternative 1 (north of the river alternative) would have a net beneficial effect on the Logan River and its riparian zone.

Under Alternative 2 (cross-river alternative), a relatively high-value reach of the riparian zone along the river would be further fragmented by the bridge crossing, contributing to cumulative impacts associated with extensive riparian vegetation removal along reaches immediately downstream. Considering the loss of riparian functions and values, including heat attenuation through shading, filtration of sediment and suspended contaminants from overland runoff, uptake of nutrients and dissolved contaminants from runoff, and input of primary production which forms the basis of the food chain in the river as well as the fragmentation of important wildlife habitat, Alternative 2 (cross-river alternative) would be the most detrimental alternative to the Logan River and its riparian zone.

Open Space Resources (Map 3; Photos 3 through 6) – Alternative 3 (minimal action alternative) would have no effect on open space resources.

Alternative 1 (north of the river alternative) would reduce the value of a small area of open space that is currently not accessible by the public in the rear lots of residences along 100 East.

The implementation of Alternative 2 (cross-river alternative) would fragment a large area of open space that is managed by private landowners as wildlife habitat or grazing land and is visually accessible to the public along the 500 South/300 East/Riverdale Avenue roadway, which is a one-lane, partially paved street with a 10 mile-per-hour speed limit that provides a frequently used pedestrian pathway. Alternative 2 would introduce traffic, streetlights, and impermeable surfaces into an area that is currently nearly devoid of urbanization, significantly reducing the quality of the open space resources. Alternative 2 would be the most detrimental alternative to open space resources in an area of

Logan/Providence that is increasingly occupied by high-density housing with little or no dedicated open space for residents.

Wildlife and Habitat Resources (Map 2; Photos 1 through 11) – The area that would be affected by Alternative 3 (minimal action alternative) is completely urbanized and the changes resulting from Alternative 3 would have little or no effect on wildlife and habitat resources.

Implementation of Alternative 1 (north of the river alternative) would adversely impact a small area of poor-quality wildlife habitat in the rear lots of residences along 100 East. These impacts would affect mostly songbirds and small mammals typical of residential areas. The presence of the roadway and traffic along the north side of the river would also impact habitat quality associated with the river and riparian zone, but the impacts could be ameliorated and potentially mitigated by restoration and enhancement measures within the currently degraded riparian zone that would be located parallel to the Alternative 1 roadway.

Wildlife and habitat resources that would be adversely impacted by implementation of Alternative 2 (cross-river alternative) include nesting by red-tailed hawks and owls, nesting and wintering habitat for migratory songbirds, pheasants, and waterfowl, and year-round use by as many as two dozen mule deer. The habitat resources include numerous, irreplaceable legacy conifers and cottonwood trees, both along the Logan River and in the adjacent open space (Photo 6). The Logan River riparian zone provides a corridor for movement by wildlife, which would be interrupted by a bridge unless provisions were made to leave space between the river and the bridge abutments. The acreage of habitat resources, as well as the quality of those resources, that would be affected by the introduction of traffic, noise, streetlights, and fragmentation associated with Alternative 2 (cross-river alternative) substantially exceeds the potential impacts of either Alternative 1 (north of the river alternative) or Alternative 3 (minimal action alternative).

Recreational and Visual Resources (Map 4; Photos 10 through 13) – The improvements associated with Alternative 3 (minimal action alternative) would not modify recreational or visual resources from their current conditions other than indirect effects of increased traffic.

Implementation of Alternative 1 (north of the river alternative) would not adversely affect recreational or visual resources available to the public but would provide the opportunity for the Logan River Trail to continue adjacent to the north side of the river on publicly owned land with the addition of one potentially hazardous road crossing over 100 East. Restoration and enhancement of the riparian zone where the roadway parallels the river could incorporate a paved shared use trail surface from the 100 East crossing to sidewalks along 300 South. Alternative 1 could potential enhance recreational and visual resources available to the public.

Recreational and visual resources that would be adversely affected by Alternative 2 (cross-river alternative) include potential hazards to kayakers and other boaters associated with an additional bridge across the river, the introduction of an additional potentially hazardous road crossing for pedestrians using the one-lane wide, low traffic volume 500 South/300 East/Riverdale Avenue roadway as a popular path, and the degradation of high-quality visual resources provided to the public by the open space, pastures, wildlife, and tranquility that are characteristic of the undeveloped area south of the Logan River. The introduction of traffic, noise, streetlights, and other urban features by the implementation of Alternative 2 would result in the greatest reduction in the quality of recreational and visual resources of the three Alternatives.

Agricultural Resources (Photo 6) – Implementation of Alternative 3 (minimal action alternative) or Alternative 1 (north of the river alternative) would have no impact on agricultural resources other than private gardens on residential lots. Implementation of Alternative 2 (cross-river alternative) would decrease the amount and degrade the quality of pasture acreage grazed by horses, including horses essential to a horseback riding business in Logan Canyon.

Residential Resources (Map 1) – Alternative 3 (minimal action alternative) would require the removal of the least residences of the three alternatives. Depending on alignment and corridor width, Alternative 1 (north of the river alternative) and Alternative 2 (cross-river alternative) would require the removal of the same number of residences.

Implementation of Alternative 3 (minimal action alternative) would potentially increase traffic volume along one block of 300 South, which is already functioning as a collector road. Implementation of Alternative 1 (north of the river alternative) or Alternative 2 (cross-river alternative) would severely degrade the quality of life for residents in the cul-de-sac between 300 South and the Logan River by removing homes and introducing traffic, noise, and diminished air quality into what is currently a quiet residential area.

Municipal Resources – Alternative 1 (north of the river alternative) and Alternative 3 (minimal action alternative) would be completely located within the City of Logan and would be built and maintained as Logan City roads. Several hundred feet of Alternative 2 (cross-river alternative) would be located within the River Heights City boundaries, which would impose construction and maintenance costs onto River Heights and possibly complicate jurisdictional issues. Because of the land use and land ownership along the River Heights stretch of Alternative 2, no potential increase in tax revenue would be available to the city as a result of the road extension.

In summary, Alternative 3 (minimal action alternative) would have the least adverse effects on all resources under consideration, including cost, the Logan River and riparian zone, open space, wildlife and habitat, recreational and visual resources, agricultural resources, and municipal resources. Definitive data must be presented to justify that this alternative would be significantly less effective in accomplishing the goals of facilitating traffic flow and reducing congestion during heavy traffic periods because it does not differ significantly from Alternative 1 (north of the river alternative) and Alternative 2 (cross-river alternative) in terms of intersections to be navigated and turns to be made to connect 200 East to 100 East. It is not sufficient justification for implementation of Alternative 1 (north of the river alternative) or Alternative 2 (cross-river alternative) if those alternatives would merely transfer comparable traffic congestion to a new location a few blocks to the south and west.

In a comparison between Alternative 1 (north of the river alternative) and Alternative 2 (cross-river alternative), Alternative 1 would have significantly less adverse effects on all resources than Alternative 2. Alternative 1 would provide benefits relative to Alternative 2 in terms of allowing a connection between north/south traffic flow and east/west traffic flow, as well as the opportunity for riparian restoration/enhancement along several hundred feet of a degraded reach of the Logan River.

CONCLUSION

Almost all of the current transportation plans for Logan City and the CMPO include an extension of 200 East to the south along the Alternative 2 (cross-river alternative) alignment. The information in this

document supports the conclusion that there are at least two other Alternatives that would result in significantly fewer impacts to environmental, social, and municipal resources.

INTRODUCTION

The purpose of this memo is to describe the potential benefits and impacts of three alternatives for an extension of 200 East to the south in Logan. The benefits and impacts of the alternatives will address primarily the environmental aspects of the road extension but will also address some of the related social and administrative aspects of the project.

PROJECT DESCRIPTION

Currently, the widened stretch of 200 East extends from Center Street to 300 South in Logan. Traffic following the route is required to travel one block west along 300 South to connect to 100 East in order to continue traveling to the south. Logan City and the Cache Metropolitan Planning Organization (CMPO) have included an extension of 200 East to the south with a more gradual connection to 200 East on most of their future plans for transportation.

DESCRIPTION OF ALTERNATIVES

Three alternatives have been considered for their potential benefits and impacts. Alternative 1 is the North of the Logan River Alternative. Alternative 2 is the Cross-River Alternative. Alternative 3 is the No or Minimal Action Alternative (Map 1).

Alternative 1 (north of the river alternative) proposes the extension of a widened 200 East to the south of 300 South for approximately 165 feet before initiating a curved alignment to the west. This alignment would extend along the north side of the Logan River for approximately 700 feet before turning to the west for another 200 feet to connect with 100 East. The intersection with 100 East would align with 400 South, providing a connection between north-south traffic flow and east-west traffic flow. This alternative would include an intersection to cross 300 South and an intersection to turn left onto 100 East or proceed west on 400 South.

Alternative 2 (cross-river alternative) proposes the extension of a widened 200 East to the south of 300 South for approximately 460 feet and the construction of a bridge over the Logan River. South of the bridge the roadway extension would initiate a curved alignment that crosses 500 South and ultimately connects with 100 East between the northwesternmost building at the Falls at Riverwoods apartment complex and the Central Milling office building. Alternative 2 would include an intersection to cross 300 South and an intersection to turn left onto 100 East. The intersection with 100 East would be located on a curve and would align with a driveway exit from the Falls at Riverwoods and with the intersection of 80 East with 100 East which provides an exit from the Springhill Suites hotel, the Riverwoods Conference Center, the associated parking garage/lots, and several retail and restaurant businesses.

Alternative 3 (minimal action alternative) proposes no extension of 200 East to the south with improvements to the intersections of 100 East and 200 East with 300 South, as well as potential widening of the block of 300 South between 200 East and 100 East. Alternative 3 would include existing intersections to right onto 300 South and left onto 100 East.

Almost all of the current transportation plans for Logan City and the CMPO include an extension of 200 East to the south along the Alternative 2 (cross-river alternative) alignment. The information in this document supports the conclusion that there are at least two other alternatives that would result in significantly fewer impacts to environmental, social, and municipal resources.

AFFECTED RESOURCES

Resources present within the areas of potential impact (API) of the 200 East alternatives include environmental (open space, water quality, wildlife, habitat quality), recreational, residential, agricultural, and municipal resources. Issues related to the road extension include traffic and cost issues.

Traffic Issues – The incentives for construction of an extension of 200 East to the south include facilitation of north/south traffic flow between Logan and towns to the south, as well as alleviation of current traffic congestion at the intersections of 200 East with 300 South and 100 East with 300 South, particularly during heavy traffic conditions (Map 1). Ultimately, the goal of extending 200 East is to reduce traffic congestion on Main Street, the principal north/south corridor through downtown Logan.

Logan River and Riparian Zone - The most significant environmental resource within the API is the Logan River, which is the primary channel within a 530 square mile watershed. The value of the water flowing in the river channel is arguably the most significant environmental resource in the watershed. Water quality and quantity in the river are affected by the condition and continuity of the adjacent riparian zone which provides heat attenuation through shading, filtration of sediment and suspended contaminants from overland runoff, uptake of nutrients and dissolved contaminants from runoff, and input of primary production which forms the basis of the food chain in the river. The riparian zone also provides a corridor for wildlife movement along the river under the cover of the streamside vegetation. Impacts to the river and riparian zone within the API have the potential to extend outside of the immediate vicinity in both upstream and downstream directions.

The API for Alternative 1 (north of the river alternative) extends parallel to the north side of the Logan River for approximately 450 feet (Map 2). Depending on the width of the API and any buffer zone that would be managed and maintained in conjunction with the roadway, the riparian zone along that reach may be included in the API. The riverbank and riparian zone in most of this reach is currently in a degraded condition with concrete debris on the banks and little woody riparian or understory vegetation (Photos 1 and 2).

The reach of the Logan River that includes the API for Alternative 2 (cross-river alternative) is the only remaining reach of the Logan River within the Cache Valley downstream of Logan Canyon that supports a riparian zone dominated by mature cottonwood trees (*Populus fremontii*) (Map 2, Photos 3 and 4). This riparian canopy contributes to higher habitat values for fish and wildlife relative to reaches supporting riparian zones dominated by crack willow (*Salix fragilis*) or lacking in tree canopy, including the adjacent downstream reach from which the tree canopy has been removed from one or both banks of the river for over 2,675 feet. The riparian canopy of mature cottonwood trees extends upstream uninterrupted for more than 1,150 feet on at least the south bank of the river, between the 400 East and 100 East crossings. This is also one of the few remaining reaches of the river within the urban area between the mouth of Logan Canyon and the Logan River Golf Course with substantial acreage of undeveloped land (open space) immediately adjacent to the river and its riparian zone.

No part of the API for Alternative 3 (minimal action alternative) is located in close proximity to the Logan River (Map 2).

Open Space Resources - Open space is a crucial aspect of the urban environment, providing valuable breathing room and enhancing quality of life for the public. Open space is not merely a luxury but a

necessity for promoting a healthy and sustainable living environment. Each type of open space serves a distinct purpose, providing opportunities for outdoor activities, wildlife habitat preservation, or simply enjoying nature. These activities promote physical fitness, reduce stress levels, and improve mental well-being. Open space also contributes to environmental sustainability by promoting biodiversity, reducing heat island effects, mitigating stormwater runoff, and improving air quality. It allows for the preservation of trees and other vegetation, which in turn helps in carbon sequestration and mitigating climate change impacts. Open spaces also serve as natural habitats for various plant and animal species.

Open space crossed by the API for Alternative 1 (north of the river alternative) consists of a single one-acre residential lot, occupied by one house and a garage with the remainder of the lot undeveloped, and the undeveloped backyards of two additional residences (Map 3s).

Open space that includes the API for Alternative 2 (cross-river alternative) consists of more than 15.5 acres of currently undeveloped land surrounding five residential buildings along the 500 South/300 East roadway with additional undeveloped land adjacent to the east (Map 3). The undeveloped land between the 500 South/300 East roadway and the Logan River is currently assessed as agricultural or green belt and is owned by two landowners that have expressed no interest in further urbanization of their property for the foreseeable future. This commitment will protect the open space and wildlife habitat values of the property with no requirement for municipal funding or input.

The opportunities for recreational activities provided by these open space resources, as well as enjoyment of open space visual benefits, are particularly valuable due to their location and urban surroundings. As more multi-family buildings replace single family homes and empty lots within walking distance of the API for Alternative 2 (cross-river alternative), with little or no provision for dedicated open space associated with those buildings, the presence of undeveloped natural land with no plans for development in the foreseeable future is especially valuable to the community. Additionally, this undeveloped open space provides recreational opportunities and open space values to visitors to the nearby hotels/conference center and to employees of call centers and other businesses in the vicinity (Map 3)

The API for Alternative 3 (the minimal action alternative) does not include any open space resources but it terminates on the west end adjacent to a small park.

Wildlife and Habitat Resources – The limited open space within the API for Alternative 1 (north of the river alternative) provides some potential habitat for songbirds and possibly pheasants. Other habitat resources on the north side of the Logan River include landscaping within residential lots. These resources are enhanced to some degree by proximity to the river and the large crack willow trees in the riparian zone which provide opportunities for roosting and nesting by smaller birds. Squirrels and other small mammals are also present within the riparian zone and within the larger, less-landscaped backyards of houses along 100 East.

Open space and mature trees on the south side of the river, including several large, legacy cottonwood trees and conifers, provide habitat for nesting raptors (Photos 5 and 6). Raptors (birds of prey) are protected wildlife and are considered to be migratory birds. Each raptor nest, its offspring, and supporting habitats are considered important to the long-term viability of raptor populations and are vulnerable to disturbance by many human activities. Such disturbance, resulting in the failure or abandonment of a nest by raptors would be considered a “take”, which is unlawful under the Migratory

Bird Treaty Act. Similarly, wintering habitat is considered to be crucial to raptor populations and disturbance of such habitat, resulting in abandonment, would be considered a “take”.

Overall, raptors display a high degree of fidelity to nest sites and nesting territories. Within the API for Alternative 2 (cross-river alternative), red-tailed hawks have successfully nested for over two decades. The extension of 100 East across the Logan River and the construction of the Falls at Riverwoods resulted in the relocation of the active nest from the large cottonwood trees at 110 East 500 South to the mature conifer trees located within the API for Alternative 2 in the pasture between 165 East 500 South and 201 East 500 South, but the relocated nest has remained active and successful (Map 2).

In the past, bald eagles constructed a winter nest in large cottonwood trees along the Logan River upstream of the proposed crossing for Alternative 2 (cross-river alternative) (Photo 7). At least one pair of eagles, as well as their immature offspring, returned to the API vicinity every winter for over two decades, using trees in the neighborhood for nighttime roosts even after the branch supporting the winter nest fell. The eagles abandoned the neighborhood as wintering habitat after the removal of the large riparian trees along the Logan River between 100 East and Main Street and have only been observed occasionally flying over the API since then.

In addition to the pair of red-tailed hawks that have raised young in the vicinity of the API for Alternative 2 (cross-river alternative) during most years, great horned owls are frequently present and screech owls have also successfully raised young in the area. Turkey vultures commonly gather in the large cottonwood trees along the river and other mature trees on the south side of the river in preparation for the fall migration. Cooper’s hawks are present during the winter, attracted by populations of songbirds. Flocks of Bohemian waxwings rely on hawthorn and chokecherry fruits produced in the riparian zone along the Logan River and in hedgerows along irrigation ditches on the south side of the river, along with other songbirds. Belted kingfishers and waterfowl frequently use the river for feeding, with increased numbers of ducks present on the river during the migration. Ring-necked pheasants raise broods of chicks annually and Canada geese have also successfully raised young in nests located near the API for Alternative 2. Squirrels, yellow-bellied marmots, and other small mammals are also resident in habitat provided by open space within and adjacent to the API for Alternative 2 (cross-river alternative).

The API for Alternative 2 (cross-river alternative) between the Logan River and the Falls at Riverwoods apartment complex provides important habitat for the urban deer herd that migrates from the foothills along the Logan River. In all seasons of the year, up to two dozen does, fawns, and bucks use the river corridor and adjacent open pastures for food and shelter. Lower levels of human disturbance in this location create a preferred refuge for the herd, especially in the winter, likely reducing their presence and associated damage to landscaping in the more urban parts of River Heights. Several exceptionally large bucks have also been resident in this area and several fawns are born in the open space area along the river every year, both of which are popular with recreational photographers and other visitors to the neighborhood (Photos 8 through 11).

Habitat values associated with open space on both sides of the Logan River are enhanced by dark sky conditions that result from distance from streetlights along 100 East and 300 South. The relative absence of outside lighting associated with residences and outbuildings also enhances the contribution of dark sky conditions to habitat, particularly in comparison to the north side of the Logan River where residential lots are denser.

The quantity of open space on the south side of the Logan River (API for Alternative 2 – cross-river alternative) and its connectivity with other habitat along the river corridor greatly exceeds that on the north side of the river (API for Alternative 1 – north of the river alternative), which increases the value of the available habitat. Outbuildings, driveways, and other urban land uses occupy a larger proportion of the open space on the north side of the river relative to the south side.

The API for Alternative 3 (minimal action alternative) does not include any wildlife or habitat resources other than those provided by residential lots and street trees.

Recreational and Visual Resources – Much of the API associated with Alternative 1 (north of the river alternative) along the north side of the Logan River is located within residential house lots and is not available for recreation by the public. The street and sidewalks within the cul-de-sac and along 100 East provide the only recreational resources available to the public.

The API associated with Alternative 2 (cross-river alternative) includes the Logan River, which is used for recreation by kayakers, inner tube floaters, and fishermen. The 500 South/300 East/Riverdale Avenue roadway is a one-lane, partially paved street with a 10 mile-per-hour speed limit. The reduced, slow speed traffic on the road, as well as the surrounding open space and natural vegetation, make it an attractive path for pedestrians and recreation (Map 4, Photos 12 and 13). Numerous pedestrians (with and without children, strollers, and pets), bicyclists, horseback riders, and occasional four-wheelers use 500 South/300 East/Riverdale Avenue every day, taking advantage of the low traffic volumes and speed, the open space atmosphere, and the opportunity to enjoy wildlife sightings. The public using the road through the neighborhood benefits from the visual contrast of the open space and natural vegetation to the surrounding urban environment. Wildlife photographers frequently stop along the road to photograph the large mule deer bucks, raptors, and other birds that flourish in the open space south of the Logan River. One large willow tree located within the API for Alternative 2 has been used as a geocache for several years, attracting visitors from further outside of the local neighborhood.

Recreational fishing is provided by the Logan River in the vicinity of the APIs for Alternatives 1 and 2 (north of the river and cross-river alternatives, respectively). Access to the river without trespass is currently limited to the vicinity of the 100 East bridge over the river.

The API for Alternative 3 (minimal action alternative) includes only a standard collector street (300 South) and sidewalks as recreational resources available for the public.

Agricultural Resources – North of the Logan River (API for Alternative 1 – north of the river alternative), vegetable gardens occupy portions of open space behind some residences. Some residences may also have facilities for raising poultry or rabbits in their yards.

South of the Logan River (API for Alternative 2 – cross-river alternative), open space is adequate for pasturing livestock, currently horses.

Residential Resources – Within the API for Alternative 1 (north of the river alternative), ten residences are located either within the footprint for the proposed roadway or in very close proximity to it. In addition, five outbuildings behind residences are included in the API. Most of these residences are located within a cul-de-sac that currently experiences little traffic.

Within the API for Alternative 2 (cross-river alternative), ten residences are located either within the footprint of the proposed roadway or in very close proximity to it. As with Alternative 1 (north of the river alternative), most of the residences within or near the API for Alternative 2 (cross-river alternative) are located in a cul-de-sac with little vehicular traffic. In addition, one building of the Falls at Riverwoods apartment complex is located close to the footprint of this proposed roadway alternative, as well as one of the main outlets from the apartment complex parking lot to 100 East.

The APIs associated with improvements to intersections of 100 East and 200 East with 300 South under Alternative 3 (minimal action alternative) are likely to include three or four residences. If 300 South were to be widened, the API for that improvement is likely to include an additional five or six residences.

Municipal Resources – The APIs for Alternative 1 (north of the river alternative) and Alternative 3 (minimal action alternative) are located entirely within Logan City limits. Responsibility for maintenance of the entire roadway would be Logan City's.

Approximately 670 feet of the proposed roadway under Alternative 2 is located within River Heights City limits and includes a crossing of 500 South, a River Heights road. Maintenance of this stretch of roadway and possibly some portion of the bridge over the Logan River would be the responsibility of River Heights.

The remainder of the proposed roadway under Alternative 2 (cross-river alternative) is located in Logan City and coincides near the southern end with one of the main outlet driveways from the Falls at Riverwoods apartment complex, as well as the intersection of 80 East with 100 East which serves as an outlet for the Riverwoods Conference Center, the Spring Hill Suites Hotel, the associated parking garage, and a number of restaurants and commercial businesses.

DISCUSSION OF EFFECTS ON RESOURCES

Traffic Issues – All three Alternatives would improve north/south traffic flow and alleviate to some extent traffic congestion at the intersections of 200 East with 300 South and 100 East with 300 South. Alternative 1 (north of the river alternative) and Alternative 2 (cross-river alternative) would be equally effective in eliminating the right turn from 200 East onto 300 South. Both alternatives, however, retain the same conditions that currently exist in terms of requiring a crossing through an intersection at 200 East and 300 South and a necessary left turn to transfer from the 200 East extension to continue south on 100 East (Map 1). Both alternatives could conceivably offer little improvement to traffic flow, other than moving the area of congestion during heavy traffic conditions a few blocks south and west of where they currently occur. Improvements in traffic flow resulting from improved intersections at 300 South and 100 East as features of Alternatives 1 and 2 could also be accomplished with similar improvements at the existing intersections as part of Alternative 3 (minimal action alternative) without the need for construction of additional roadway and the associated impacts.

In addition to connecting to 100 East, Alternatives 1 (north of the river alternative) and Alternative 3 (minimal action alternative) connect directly to existing east/west corridors (300 South and 400 South) which would facilitate access to the west side of Logan and to other principal north/south corridors including 600 West (Map 5). Alternative 2 (cross-river alternative) connections to east/west corridors and the west side of Logan are much less direct, restricting the potential benefits of this alternative to traffic flow to only the north/south direction.

In addition, the intersection between Alternative 2 (cross-river alternative) and 100 East is located immediately after a curve in 100 East on a downward slope from the Logan River bridge (Map 1). It coincides with an exit from the Falls at Riverwoods apartment complex and with 80 East, which is a principal exit from the Springhill Suites hotel, the Riverwoods Conference Center, the associated parking garage, and several restaurants and stores. Converging traffic from the apartment complex, the conference center, the hotel, and retail/restaurant businesses, combined with limited visibility due to the curve at the location of the proposed intersection, renders the proposed intersection hazardous, especially relative to the proposed intersections of Alternative 1 (north of the river alternative) and Alternative 3 (minimal action alternative) with a straight, flat segment of 100 East (Map 5).

Cost Issues - The length of roadway required to implement Alternative 1 (north of the river alternative) would be approximately 1,100 feet. The length of roadway required to implement Alternative 2 (cross-river alternative) would be approximately 1,900 feet. Assuming an identical road width for both alternatives, the costs of building and maintaining the roadway would be proportionally less for Alternative 1 (42% less). Both alternatives would require the construction of roundabouts or installation of traffic lights in two new locations, unless Alternative 2 requires additional intersection improvements where it crosses 500 South which would add a third. In addition, Alternative 2 would require the construction of a bridge over the Logan River, which would increase costs associated with this alternative substantially (Map 1).

Alternative 3 (minimal action alternative) would be the least expensive of the alternatives as it would require the least new road construction, only one new traffic light or roundabout, and the acquisition of fewer, if any, homes or buildings (Map 1).

Logan River and Riparian Zone – A portion of the roadway under Alternative 1 (north of the river alternative) would be located parallel to the Logan River and runoff from the impermeable road surface would likely be discharged into the river. The installation of trash catchers and oil/grease traps in storm drains and the establishment of a vegetated buffer zone between the roadway and the river could minimize the impacts to water quality. The extent of impact of Alternative 1 on riparian resources zone along the river would depend on how close the road is built to the river. Habitat improvements and management within a buffer zone between the roadway and the river could be implemented to ameliorate riparian zone impacts and actually improve habitat quality of a currently degraded reach of the river, as well as provide visual and recreational values for the public (Map 2).

The construction of a bridge over the Logan River under Alternative 2 (cross-river alternative) would introduce a point source of potential impact to water quality due to runoff from the roadway directly to the river with no opportunity for a vegetated buffer zone. The bridge crossing would also further fragment the riparian corridor within an important reach for habitat values due to the composition of the tree canopy and the availability of open space contiguous with the riparian zone. Because many of the values associated with riparian resources are dependent on the extent of uninterrupted riparian zone, including the movement of wildlife along the riparian corridor, another breach for a roadway could greatly reduce or even eliminate the value of the remaining fragments of riparian zone for some resources. Other functions of an intact riparian zone, including heat attenuation through shading, filtration of sediment and suspended contaminants from overland runoff, uptake of nutrients and dissolved contaminants from runoff, and input of primary production which forms the basis of the food chain in the river would be similarly diminished.

The reduction and fragmentation of the Logan River riparian zone within the API for Alternative 2 (cross-river alternative) would contribute to cumulative impacts to an increasingly degraded reach of the river. Immediately downstream of the proposed crossing, the riparian tree canopy has been removed from one or both banks of the river for more than 2,675 feet. The extent of these impacts and their proximity to the API for Alternative 2 increase the relative importance of the intact riparian forest canopy that remains upstream of the degraded reach and would be impacted by Alternative 2 (Map 2).

The implementation of Alternative 3 (minimal action alternative) would not impact the Logan River or its riparian zone.

Open Space Resources - Under current conditions, the APIs for Alternatives 1 and 2 (north of the river and cross-river alternatives, respectively) provide different levels of open space resources, although those resources within both APIs are of relatively high value due to their proximity to the Logan River. The API for Alternative 1 (north of the river alternative) includes open space along the Logan River in the form of back yards of residences along 100 East for approximately 31% of its length. These resources are not accessible to the public and are of varying amounts of value as habitat, depending on the uses to which the properties are subject. Implementation of Alternative 1 would result in the loss or degradation of most of the open space resources within the API for this alternative due to the introduction of a collector road, including traffic and streetlights associated with the roadway (Map 3).

The API for Alternative 2 (cross-river alternative) includes open space adjacent to the Logan River in the form of pastures and open land managed by private landowners as wildlife habitat or grazing land for approximately 72% of its length. This open space is visually accessible to the public along 500 South/300 East and provides unique habitat values as a result of its location adjacent to the river and the amount of undeveloped land within an otherwise urbanized environment. The implementation of Alternative 2 would fragment the open space and introduce traffic, streetlights, and impermeable surfaces into an area that is currently nearly devoid of urbanization, significantly reducing the quality of the open space resources within the API and its vicinity (Map 3).

The API for Alternative 3 (minimal action alternative) would not affect open space due to a lack of such resources within the API for this alternative.

Wildlife and Habitat Resources - It has been documented that high noise levels and increased human activity may preclude use of otherwise acceptable raptor habitats. The abandonment of the API for Alternative 2 (cross-river alternative) and its vicinity as winter habitat for bald eagles and the relocation of the red-tailed hawk nest, both in response to urban development nearby, are site-specific evidence of the impacts of destruction and fragmentation of riparian and other open space habitat on protected species. Because raptors are widely accepted indicator species of environmental quality due in part to their position at the top of biological food chains, it can be assumed that habitat disturbance sufficient to inspire nest relocation and roost abandonment in raptors is having detrimental effects on other species as well.

Some impacts to habitat due to continuing urbanization are inevitable. The U.S. Fish and Wildlife Service (USFWS) prioritizes avoidance and minimization of impacts as options for mitigation of habitat impacts, including buffer zones around nesting habitat of 0.5 mile for most hawks and 0.25 mile for screech owls and great-horned owls. Recommended habitat management strategies include closure or reduction of use of roads within high-use raptor areas; in this case, avoiding the construction of a new road through an area used for nesting and winter roosting within the API for Alternative 2 (cross-river alternative) by

selecting Alternative 1 (north of the river alternative) or Alternative 3 (minimal action alternative). Selection of Alternative 1 or Alternative 3 instead of Alternative 2 (cross-river alternative) would avoid many of the habitat impacts associated with the road extension due to a lack of habitat quality and use within the APIs for Alternatives 1 and 3 in comparison to habitat quality and use within the API for Alternative 2 (Map 2). Remaining impacts associated with Alternative 1 could be minimized during and after construction by implementation of Best Management Practices and habitat restoration activities.

Net habitat impacts of Alternative 1 (north of the river alternative) could be reduced with protection and enhancement of the riparian zone along the Logan River, as well as use of other impact reducing strategies such as shielded streetlights, vegetated buffer zones, etc. Although noise, lights, and human activity would be increased along the north side of the river, the habitat on that side of the river is currently more disturbed and subject to such impacts than on the south side of the river. With the implementation of Alternative 1 (north of the river alternative) or Alternative 3 (minimal action alternative) instead of Alternative 2 (cross-river alternative), the existing riparian forest corridor would remain intact through the reach of the Logan River between 400 East and 100 East and would likely be enhanced by restoration activities on the north side of the river where the API for Alternative 1 (north of the river alternative) is located adjacent to the river. In addition, a significant area of currently protected open space would not be fragmented.

The potential noise, light, and human activity disturbance, as well as riparian habitat fragmentation, that would result from the implementation of Alternative 2 (cross-river alternative) are anticipated to eliminate entirely any breeding/nesting habitat for at least the resident red-tailed hawks in the API and vicinity. This loss, in addition to the potential loss of breeding/nesting habitat for screech owls and wintering habitat for other owls and hawks, is indicative of the habitat impacts that would be associated with Alternative 2.

As described previously, a variety of migratory birds use habitat within the API for the project and its vicinity for nesting, feeding, and wintering. Alternative 1 (north of the river alternative) would have a minimal impact on these migratory birds, particularly if riparian protection and enhancement measures are implemented along the north bank of the Logan River. Alternative 2 (cross-river alternative) would have a much greater impact on these migratory birds, as well as ring-necked pheasants, because much of the habitat used for nesting and winter roosting/feeding by these species is located in the open space areas south of the Logan River. Implementation of road construction within the API for Alternative 2 would eliminate a substantial proportion of the hawthorn trees used for nesting and winter food. It would also eliminate several large cottonwood trees and mature conifers that are used by migratory birds and raptors, including turkey vultures.

Implementation of Alternative 2 (cross-river alternative) would also produce another gap in the riparian forest canopy along the river which would impact the river-dependent species, including belted kingfishers. Fragmentation of the riparian forest canopy by another wide gap could potentially eliminate the habitat value of the entire reach by reducing the remaining segments of forest canopy to unusable lengths for sensitive species. As mentioned previously, partial elimination and fragmentation of the intact riparian forest canopy would contribute to cumulative impacts to the habitat values associated with the Logan River riparian zone, including the habitat impacts due to the loss of tree canopy on one or both banks along more than 2,675 feet of the river, starting in close proximity to the API for Alternative 2.

Alternative 1 (north of the river alternative) would have little or no impacts on the deer using the habitat along the Logan River because the deer rarely cross the river to the north and west sides. Alternative 2 (cross-river alternative) would have a substantial negative impact on the deer herd by introducing increased human disturbance and greatly increasing the likelihood of deer/vehicle collisions on the extended roadway. The migration path for the deer follows the river and would directly cross the proposed API for Alternative 2 (cross-river alternative). This presents a safety concern for motorists and bicyclists, as well as a potentially lethal threat to the deer. The value of the open space along the south side of the Logan River would be greatly reduced in terms of deer habitat by implementation of Alternative 2.

Due to the expansion of the urban area into remaining open spaces in the city, as well as over the benches along the east side of the valley, the cumulative impacts of urban development to wildlife and, particularly, deer have been and continue to be significant. The importance of the habitat provided by the area around the Alternative 2 API (cross-river alternative) is enhanced by the combination of the progressive loss of deer habitat with the location of the API for Alternative 2 along the Logan River, which provides a natural pathway for deer migration. Vegetation cover, water, and low levels of traffic and other human disturbance provide an important refuge for the local deer herd, especially in the winter. The introduction of a collector road with high volume traffic, noise, and streetlights to the area would diminish or potentially eliminate the value of the vicinity as a refuge for the deer, contributing further to cumulative impacts to the species.

The only wildlife habitat resources within the API for Alternative 3 (minimal action alternative) consists of residential lots and street trees. Implementation of this alternative would have a minimal to no impact of wildlife or habitat resources with the exception of two legacy conifers located close to the intersection between 300 South and 100 East. With Best Management Practices, the trees could potentially be avoided by the road improvements.

Recreation and Visual Resources - Alternative 1 (north of the river alternative) would alter only existing residential development, including the backyards of some residences. The implementation of riparian protection and enhancement measures could minimize the visual and open space impacts of the road construction from the viewpoint of the public, which currently has access to the API for this alternative only from 100 East and the cul-de-sac sidewalks. Alternative 1 (north of the river alternative) would not reduce any existing recreational opportunities for the public but could enhance the opportunity for recreational fishing and boating by providing access to the north bank of the Logan River from publicly owned property between the roadway and the river.

Implementation of Alternative 1 (north of the river alternative) would enhance existing public recreation values by providing an opportunity for an extension of the existing Logan River Trail (Map 4). The trail currently extends from Trapper Park through the Logan River Golf Course and includes stretches of sidewalk along 600 South on the west side of Main Street and a paved path along the river adjacent to the TownePlace Suites hotel between Main Street and 100 East. Under Alternative 1, the trail could be extended for one block north along 100 East to 400 South and then follow the Alternative 1 corridor along the north side of the Logan River to 300 South. At this location, Alternative 1 (north of the river alternative) could provide new access for fisherman to the north side of the river from public property. Two hazardous street crossings would be required to get to the east side of Main Street and 100 East, but pedestrians would not need to cross 200 East to be able to continue along sidewalks to the east to connect to trails in Denzil Stewart Nature Park (Map 4). For at least 600 feet, pedestrians walking along the south/east side of Alternative 1 would be adjacent to the Logan River.

Alternative 2 (cross-river alternative) would introduce a collector road crossing over the 500 South/300 East/Riverdale Avenue roadway/path (Map 4), which would likely significantly reduce or eliminate the existing use of that path by the recreating public due to the hazards of crossing a high-traffic roadway. Although the 500 South/300 East/Riverdale Avenue roadway/path has not been designated as an official trail, it currently functions as a recreational asset to the local community, employees of businesses in the vicinity, and visitors to the nearby hotels and conference center, and would be significantly disrupted by a collector road crossing.

The introduction of traffic, pavement, and streetlights associated with Alternative 2 (cross-river alternative) would fragment the open space and significantly reduce the visual and other open space values of the properties on the north and west sides of 500 South/300 East/Riverdale Avenue. Whether further urbanization follows the introduction of the road immediately or not, the road itself would have a negative impact on the value of the open space and recreational opportunities for the public. In addition, the public interested in fishing from the south side of the Logan River would be required to cross 200 East to continue along the river corridor.

Recreational resources available within the API for Alternative 3 (minimal action alternative) are limited to sidewalks and roadways along 300 South and 100 East. Implementation of Alternative 3 would not impact these resources.

Municipal Issues - The API for Alternative 1 (north of the river alternative) is located entirely within the City of Logan. Maintenance of the new stretch of roadway would become the responsibility of the City of Logan, as would policing traffic and other management.

The API for Alternative 2 (cross-river alternative) would extend through the City of River Heights for approximately 670 feet from the south side of the Logan River to the south side of 500 South, continuing from there into Logan City. That segment of road would become the responsibility of River Heights for maintenance and management. The River Heights road segment would extend between properties owned by two landowners with no current plans for development. With no potential for increased tax revenue from development facilitated by the road, River Heights would be obligated to expend funds to maintain and manage the road segment with no benefit to the City.

Residential Resources – Both Alternatives 1 and 2 (north of the river alternative and cross-river alternative, respectively) are likely to require the removal of ten residences. Both alternatives would also severely impact the cul-de-sac neighborhood by the elimination of several homes and the introduction of high-volume traffic, noise, and degraded air quality into a currently quiet neighborhood.

Improvements to intersections of 100 East and 200 East with 300 South under Alternative 3 (the minimal action alternative) are likely to require the removal of three or four residences. If 300 South were to be widened, the removal of an additional five or six residences may be required. Traffic along 200 East and 300 South may increase but both are already collector roads subject to similar conditions.

SUMMARY OF POTENTIAL BENEFITS AND IMPACTS OF ALTERNATIVES

The potential benefits and impacts of the three alternatives for the 200 East roadway that are addressed in this memo are summarized here and in Table 1. More information regarding those potential benefits and impacts is presented here.

Environmental Resources – Potential Benefits of All the Alternatives include a reduction in carbon emissions associated with facilitating traffic flow and minimizing idling of vehicles at intersections due to traffic congestion.

Additional **Potential Benefits of Alternative 1** (north of the river alternative):

- Connection of 200 East to 400 South, creating a connection between north/south traffic flow and east/west traffic flow that extends directly to the west side of Logan (Map 5)
- Connection of 200 East with 100 East at a location that is flat, not located on a curve with good visibility, and not coinciding with other driveways and traffic outlets from residential or commercial entities (Map 5)
- Lower cost due to shorter length and no bridge required
- Connection of the riverside trail from the Logan River Golf Course to trails further east along a public thoroughfare and close to the north bank of the Logan River for several hundred feet, assuming the trail would be located on the south and east sides of the roadway (Map 4)
- Potential for riparian restoration and enhancement along the Logan River where the road corridor extends to the riverbank (approximately 600 feet of bank)

Potential Impacts of Alternative 1 (north of the river alternative) include:

- Increased impervious surface in the vicinity of the Logan River with increased surface runoff to the river, ameliorated by trash and oil/grease traps in storm drains
- Decreased open space values due to introduction of traffic, streetlights, and potential auxiliary urban development along the roadway corridor (Map 3)
- Decreased habitat value associated with the riparian zone along the road, depending on the width of any setbacks or preservation or enhancement of the immediate corridor along the river (Map 2)
- Removal of ten homes and three associated outbuildings

Potential Impacts of Alternative 2 (Cross-river alternative) include:

- No connection to east/west traffic flow that extends to the west of Main Street before 1200 South (100 North in Providence) which only indirectly connects to the west side of Logan (Map 5)
- Difficult intersection between 200 East and 100 East –coincident with a major exit from the Falls at Riverwoods and 80 East, which is an exit from the Riverwoods Conference Center/Spring Hill Suites Hotel/parking garage/Conservice office building (Map 5)
- Poor visibility for intersection between 200 East and 100 East – on a curve, on a slope down from the Logan River bridge
- Increase in potential flood hazards associated with an additional bridge across the river that could trap large woody debris during high flow periods
- Impacts to water quality from runoff from the bridge and connecting road (Map 2)
- Habitat fragmentation of the river corridor and associated riparian zone
- Disruption of wildlife movement along the riparian corridor at the bridge crossing
- High risk of animal/vehicle collisions because of the deer herd that follows the riparian corridor
- Elimination of nesting raptors and impacts to nesting pheasants
- Reduction in roosting and wintering habitat for raptors, migratory birds, pheasants
- Degradation by streetlights along 200 East of current dark sky conditions that currently enhance wildlife habitat and human comfort

- Potential conflicts between lighting ordinances in Logan City and the Dark Sky Ordinance passed by River Heights associated with street lighting
- Reduction of open space qualities in an increasingly urbanized vicinity (Map 3)
- Roadway would require crossing by fisherman along the Logan River
- Introduction of a busy roadway crossing over 500 South, which is currently used frequently by walking/bicycling/dog-walking public (Map 4)
- Costs to River Heights associated with participation in construction and maintenance of the roadway for no benefit – Lands adjacent to 200 East through River Heights are currently assessed as agricultural or green belt, with no plans for development in the near or medium-term future.
- Awkward maintenance due to difference in municipal jurisdictions over a two-block distance

Potential Impacts of Alternative 3 (minimal action alternative) include:

- Continued short-term traffic congestion at 200 East and 300 South
- Possible loss of three or four houses, if roundabouts are constructed at the intersections
- May reduce front yards and remove street trees along 300 South, if the roadway is widened

CONCLUSION

Almost all of the current transportation plans for Logan City and the CMPO include an extension of 200 East to the south along the Alternative 2 (cross-river alternative) alignment. The information in this document supports the conclusion that there are at least two other alternatives that would result in significantly fewer impacts to environmental, social, and municipal resources.

REFERENCES

King Lawyer. 2024. **Understanding the General Laws for Open Space around a Residential Building** <https://reyabogado.com/us/what-are-the-general-laws-for-open-space-around-a-residential-building//>
 Accessed 2/24/2024.

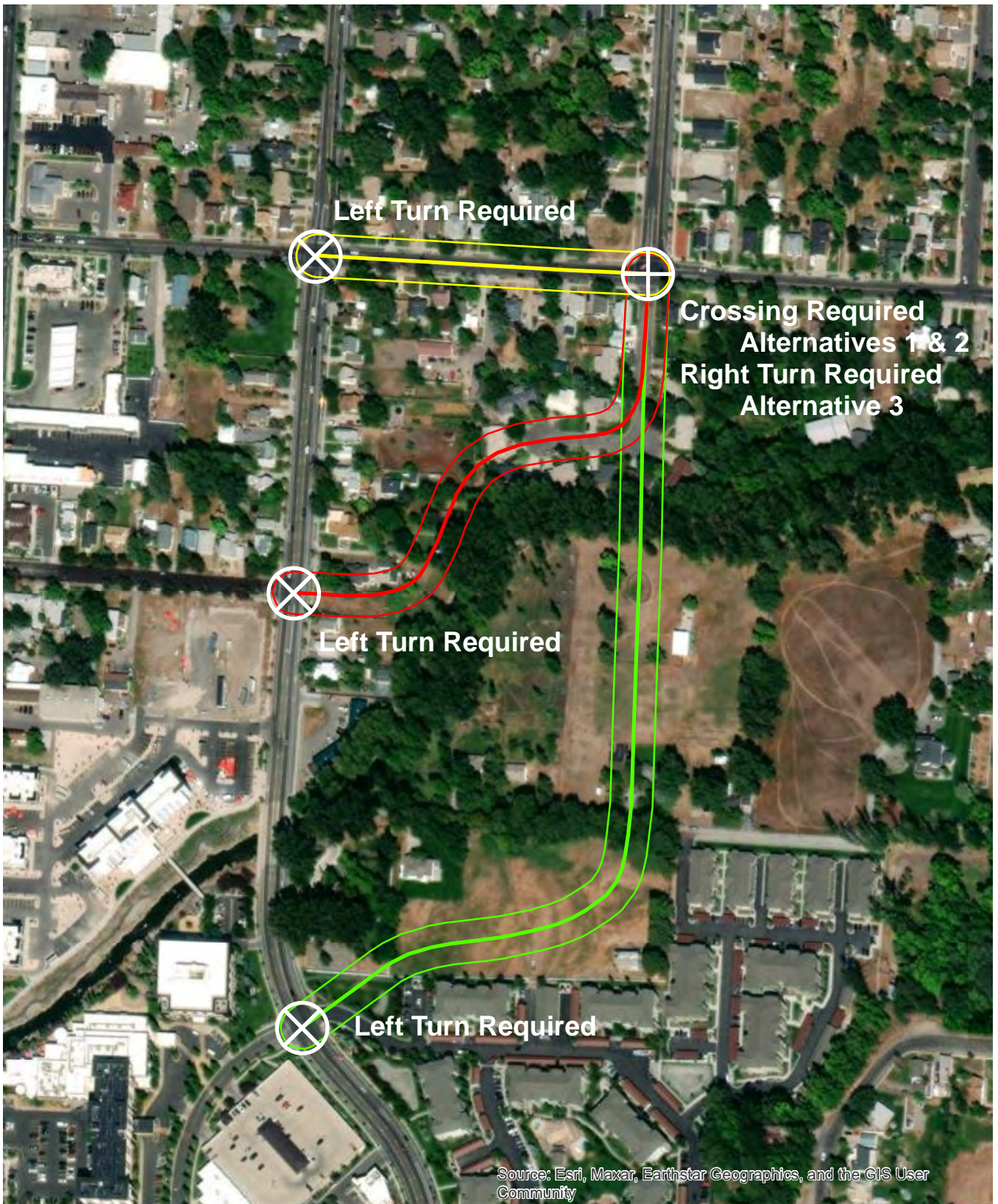
Romin, Laura A., and James A. Muck. 1999. Utah Field Office Guidelines for Raptor Protection from Human and Land Disturbances. U.S. Fish and Wildlife Service, Utah Field Office. Salt Lake City, Utah.

SUMMARY OF ALTERNATIVE PROS AND CONS

Resources	Alternative 1 North of the river		Alternative 2 Cross-river		Alternative 3 Minimal Action		Comments
	Pro	Con	Pro	Con	Pro	Con	
Traffic Patterns	Connects N/S traffic to E/W traffic		Facilitates N/S traffic	No connection to E/W traffic flow	Facilitates N/S traffic	No connection to E/W traffic flow;	Alternative 1 alignment connects with 400 South to provide access from north/south route to east/west route; Alternatives 2 and 3 only ameliorate north/south traffic flow to varying degrees
Length of Roadway	1,100 feet of new roadway			1,900 feet of new roadway	No new roadway		
Cost	Less roadway = lower construction cost; no river bridge required			More roadway = higher construction cost; river bridge required; intersection with 500 South requires improvement	Little or no new roadway; fewer homes to be purchased		
Homes Purchased		10		10		3 or 4	
Safety	Intersection with 100 E at flat location with good visibility			Poor visibility at intersection with 100 E; requires roadway crossing of 500 S; potential for deer/vehicle collisions high	No change	No change	Intersection with 100 East under Alternative 2 would be located near a curve with poor visibility and coincident with driveway and road exits from large apartment and commercial complexes
Recreation	Addition of pedestrian access adjacent to the Logan River			Impairs current recreational use of 500 S /300 E; bridge impact to boating; fragmentation of fisherman access	No change	No change	Current use of 500 South/300 East/Riverdale Avenue by recreating public impaired by Alternative 2

Resources	Alternative 1 North of the river		Alternative 2 Cross-river		Alternative 3 Minimal Action		Comments
	Pro	Con	Pro	Con	Pro	Con	
Environmental (Logan River and Riparian Resources, Wildlife and Habitat Resources)	Opportunity for riparian zone enhancement and management under municipal ownership by Logan City of up to 600 feet of riverbank and riparian zone	Increased impermeable surface and vehicular traffic close to river; decreased habitat value		Fragmentation of riparian zone/river corridor; interruption of deer/wildlife migration corridor; and wintering habitat; increased potential for flood hazard due to bridge; potential for deer/vehicle collisions; elimination of nesting/wintering raptors and habitat; decrease in nesting/wintering habitat for migratory birds/pheasants			Grease traps and trash catchers could minimize pollution to the river from extended roadway Habitat value loss under Alternative 1 could be ameliorated by riparian protection and enhancement
Open Space		Decreased open space; increased streetlights and traffic noise near riparian habitat		Degradation of unique open space adjacent to the river; degradation of dark sky conditions by streetlights; increased traffic noise	No change	No change	Streetlights must be shielded to minimize impact of any alternative to habitat Open space resources within API for Alternative 1 are not currently visually available to the public; open space resources within API for Alternative 2 are Access to open space resources is becoming more important in the increasingly urban surroundings

Resources	Alternative 1 North of the river		Alternative 2 Cross-river		Alternative 3 Minimal Action		Comments
	Pro	Con	Pro	Con	Pro	Con	
Municipal	All in Logan City			Partially in River Heights; Costs of construction and maintenance not offset by benefits; conflicts with street lights and lighting ordinance in RH;	All in Logan City		Alternative 2 API includes both River Heights and Logan Cities; Cost to River Heights are not likely to be offset by benefits



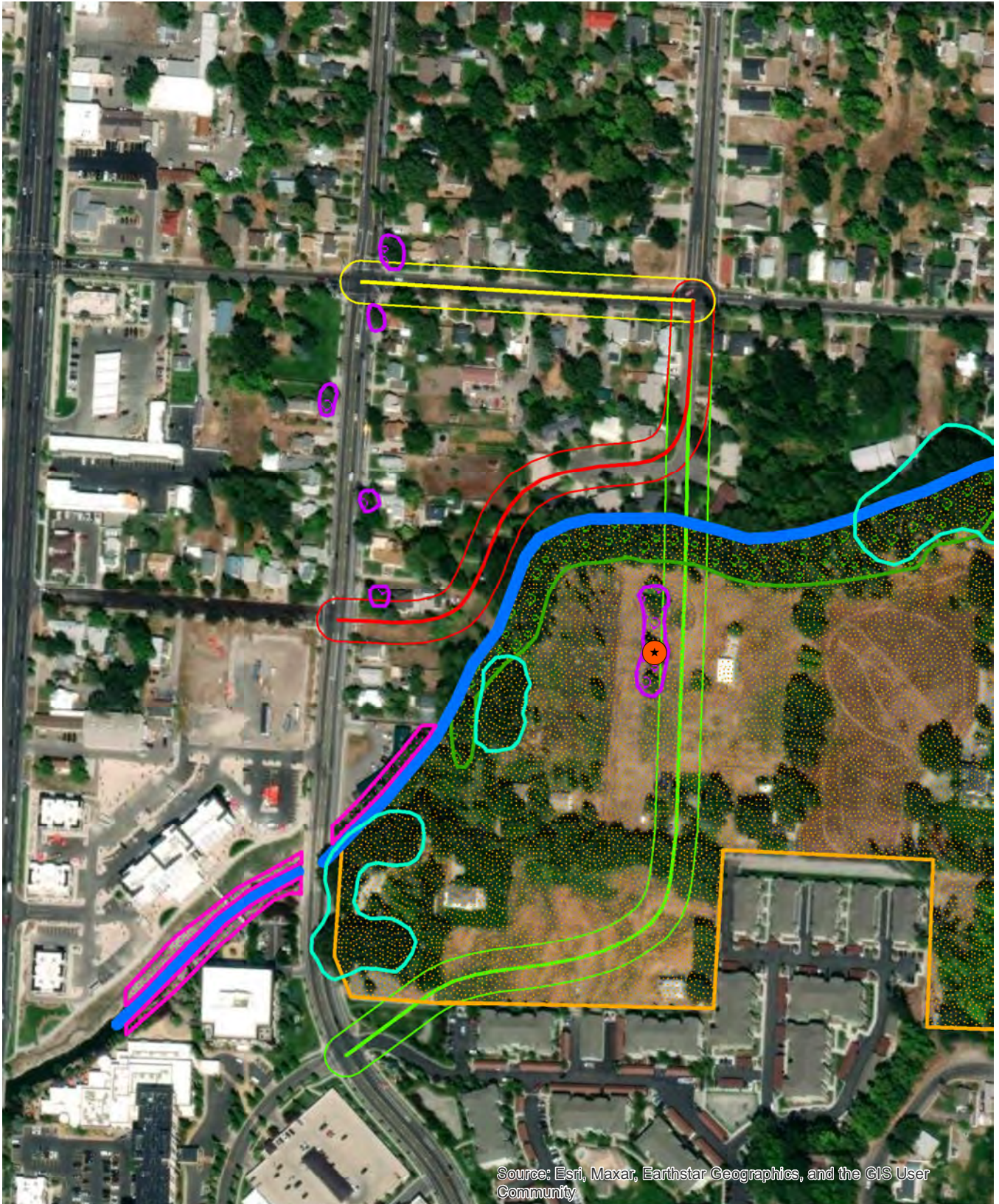
**Map 1. Alternatives for 200 East Roadway Extension to the South
 Logan, Utah**



0 105 210 420 Feet

Coordinate System: NAD1983 UTM12N
 Prepared By: Cindy Johnson

- Alternative 1 - North of River Alternative
- Alternative 2 - Cross-River Alternative
- Alternative 3 - Minimal Action Alternative



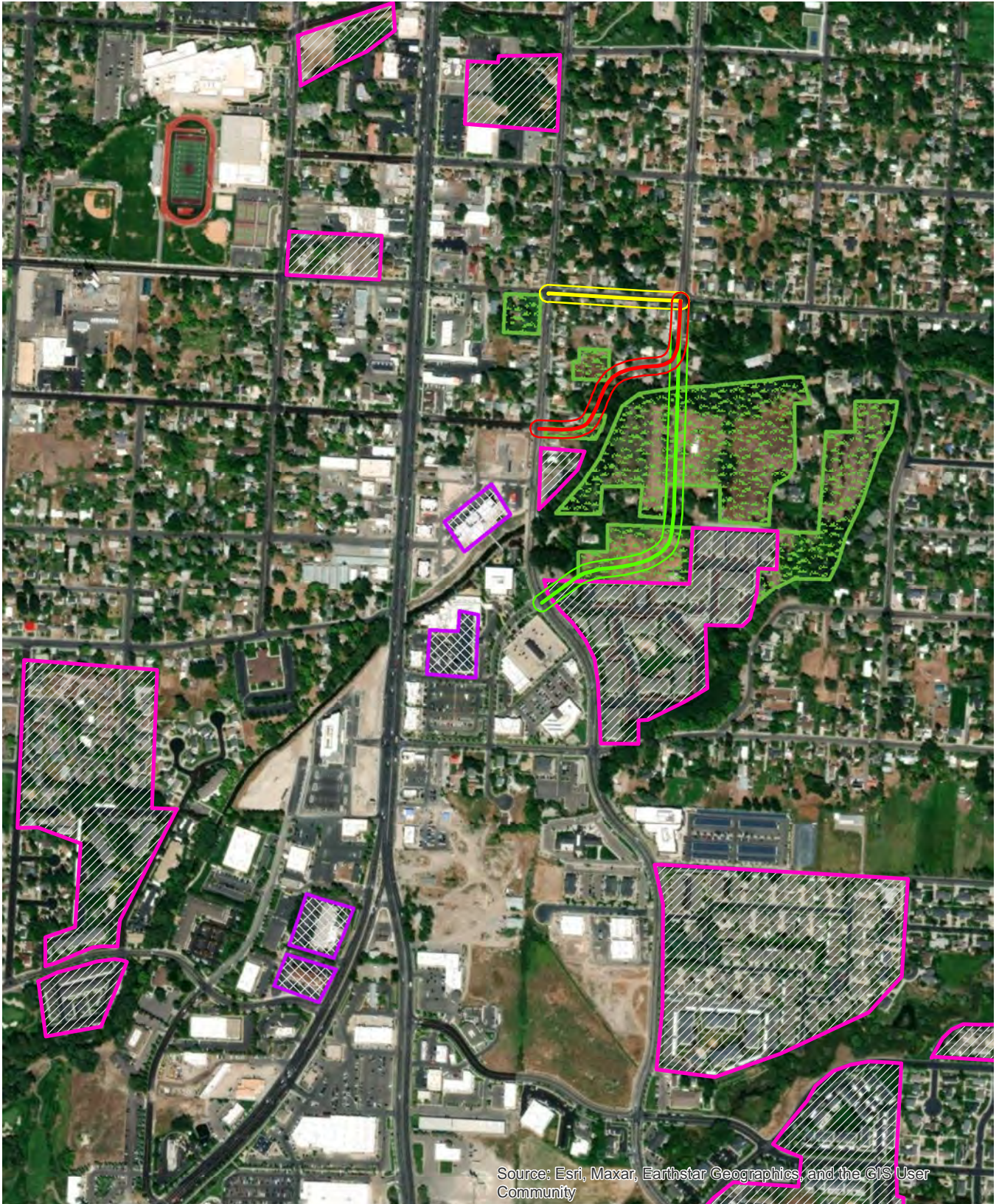
**Map 2. Logan River, Wildlife, and Habitat Resources
 Alternatives for 200 East Roadway Extension
 Logan, Utah**



0 100 200 400 Feet

Coordinate System: NAD1983 UTM12N
 Prepared By: Cindy Johnson

- Logan River
- Active Red-tailed Hawk Nest
- Cottonwood Riparian Canopy
- No Riparian Canopy
- Legacy Cottonwood Trees
- Legacy Conifers
- Deer/Pheasant Safe Habitat
- Alternative 1 - North of River Alternative
- Alternative 2 - Cross-River Alternative
- Alternative 3 - Minimal Action Alternative



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

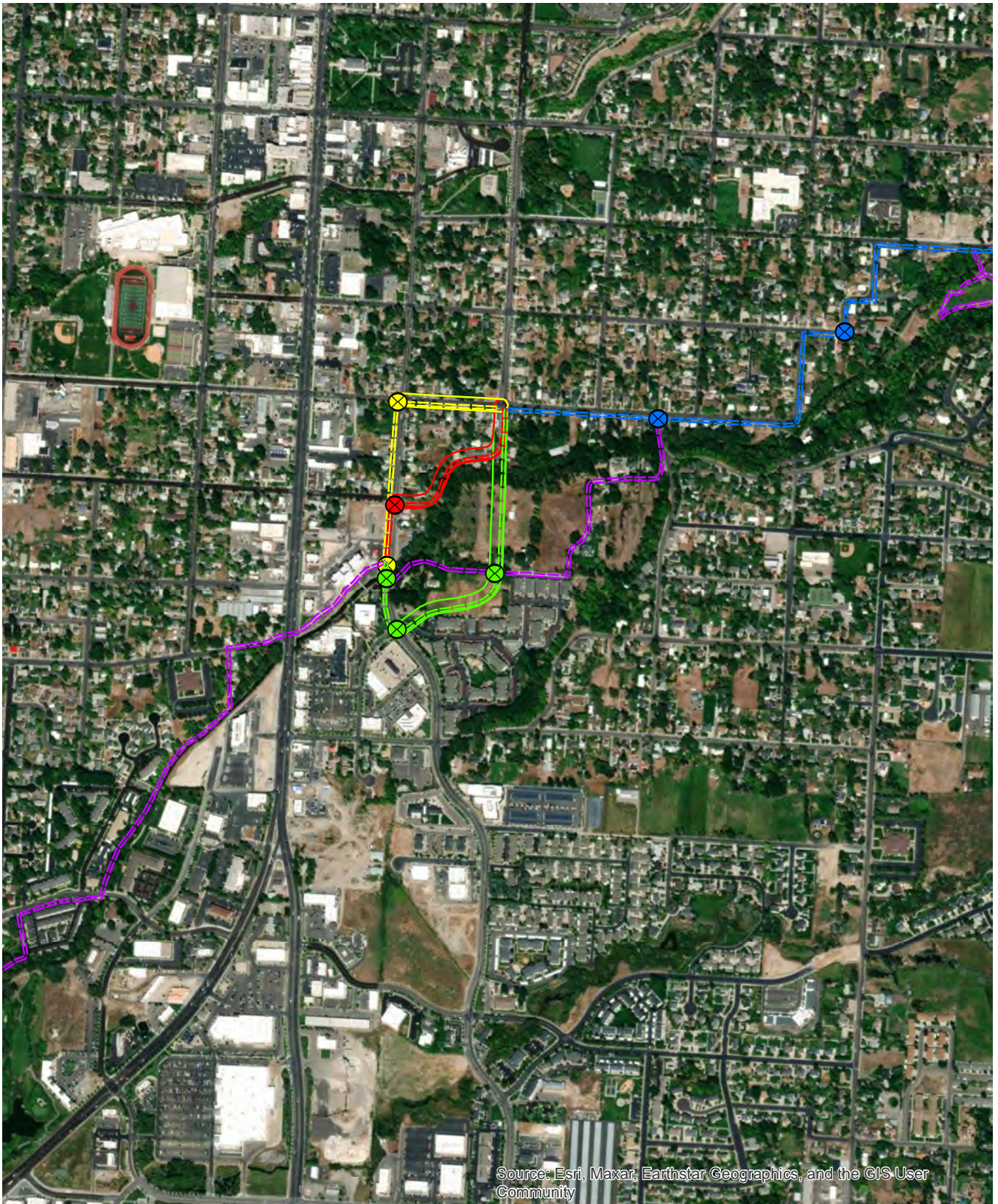
Map 3. High Density Housing Benefitting from Open Space Alternatives for 200 East Roadway Extension Logan, Utah



0 250 500 1,000 Feet

Coordinate System: NAD1983 UTM12N
Prepared By: Cindy Johnson

- Alternative 1 - North of River
- Alternative 2 - Cross-River
- Alternative 3 - Minimal Action
- High Density Housing
- Open_space
- Hotels



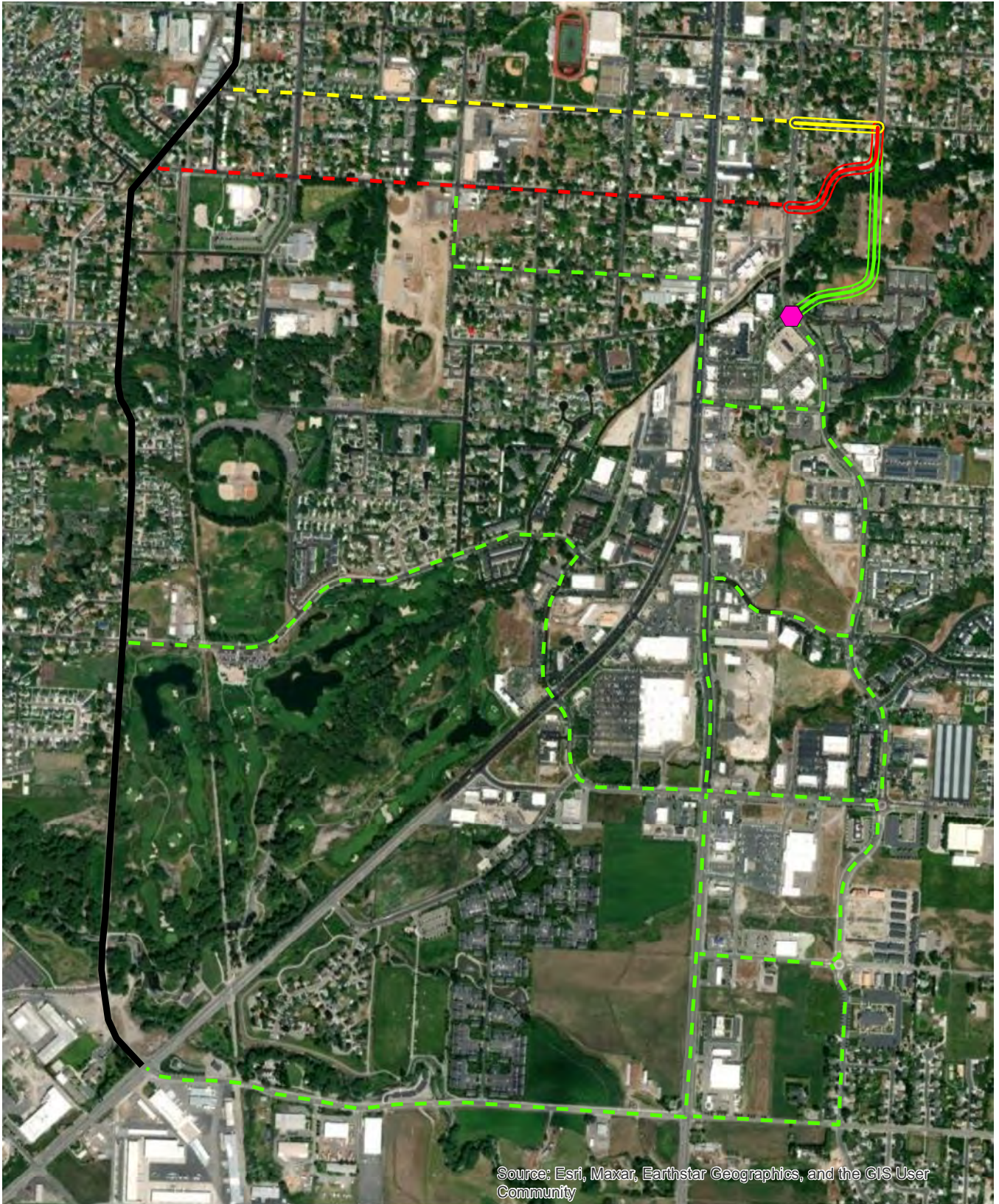
**Map 4. Connections to Existing Trails and Major Road Crossings
Alternatives for 200 East Roadway Extension
Logan, Utah**



0 337.5 675 1,350 Feet

- | | |
|---|------------------------------------|
| == Trail Connections - Alternative 1 | ⊗ Road Crossing - Alternative 1 |
| == Trail Connections - Alternative 2 | ⊗ Road Crossing - Alternative 2 |
| == Trail Connections - Alternative 3 | ⊗ Road Crossing - Alternative 3 |
| - - - Existing Trails/Pathways | ⊗ Road Crossing - All Alternatives |
| == Trail Connections - All Alternatives | |

Prepared By: Cindy Johnson



**Map 5. Connections Between North/South and East/West Traffic Patterns
 Alternatives for 200 East Roadway Extension
 Logan, Utah**



0 405 810 1,620 Feet

- - - Alternative 1 Connections
 - - - Alternative 2 Connections
 - - - Alternative 3 Connections
 - ⬡ Potentially Hazardous Intersection
- Alternative 1
 - Alternative 2
 - Alternative 3
 - 600 West Collector



Photo 1 Degraded riverbank and riparian zone along the Logan River in API for Alternative 1 (north of the river alternative).



Photo 2 Degraded riverbank and riparian zone in API for Alternative 1 (north of the river alternative), contributing to cumulative impacts to the Logan River.



Photo 3 Logan River riparian zone dominated by cottonwood trees along the reach that includes the API for Alternative 2 (cross-river alternative)..



Photo 4 Logan River riparian zone dominated by cottonwood trees along the reach that includes the API for Alternative 2 (cross-river alternative).



Photo 5 Legacy cottonwood trees near the API for Alternative 2 (cross-river alternative) that provide roosting habitat for raptors. (10-foot long ladder provides scale.) Tree in foreground has been measured at 117 feet tall, with a diameter at breast height of 8 feet.



Photo 6 Legacy conifers within the API for Alternative 2 (cross-river alternative). The large pine tree supports an active red-tailed hawk nest.



Photo 7 Bald eagles roosting in the winter in large cottonwood trees near the API for Alternative 2 (cross-river alternative). Annual use of this habitat ceased after the extension of 100 East and the removal of the riparian tree canopy west of 100 East.



Photo 8 Wintering deer in habitat that includes the API for Alternative 2 (cross-river alternative).



Photo 9 Deer using habitat that includes the API for Alternative 2 (cross-river alternative).



Photo 10 Wintering bucks in habitat that includes the API for Alternative 2 (cross-river alternative), often photographed by recreational photographers.



Photo 11 Another frequent subject of recreational photography, wintering in habitat that includes the API that includes Alternative 2 (cross-river alternative).



Photo 12 Popular pathway along 500 South/300 East/Riverdale Avenue for pedestrians, cyclists, high-density housing residents, and hotel/conference center guests which would require a crossing of 200 East under Alternative 2 (cross-river alternative).



Photo 13 Pedestrians walking along the 500 South/300 East/Riverdale Avenue pathway crossed by Alternative 2 (cross-river alternative).