Downtown Active Transportation Connectivity Action Plan

City of Huntsville March 2023







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Introduction and Existing Conditions

Introduction

Purpose and Vision

The Downtown Huntsville Master Plan identified and recommended development opportunities along with public realm, mobility, and connectivity strategies. While nearly all proposed development opportunities have moved forward, the implementation of connectivity and mobility improvements hasn't kept up at the same pace. With development comes increasing need for a functional multi-modal network of walkways and bikeways to connect into the downtown. This project identification and pre-design exercise addresses the growing need through a multi-modal lens to create an accessible downtown from points just outside the core.



Family bike ride on Fraser / Lowe Ave

Project Goals

This project is focused on improving the bicycle and pedestrian infrastructure at major gateways into downtown. The plan includes an assessment of existing infrastructure, the development of an active transportation network throughout downtown, and concept designs for spot and intersection improvements at downtown gateways. As a final end product, the plan will meet the following deliverable goals:

Create a Downtown Active Transportation Network Plan:

Identify a recommended downtown active transportation network that connects adjacent neighborhoods and connects to planned projects.

Develop Conceptual Drawings for Short term, Quick Win Projects:

Identify spot downtown gateway improvements and develop concept designs for implementation.



Lowe Ave and Madison St: This study assesses major intersections into downtown and identifies quick-win projects to improve walking and biking connectivity.

Previous Planning

This plan builds upon previous planning efforts including the 2022 Greenway Master Plan, 2020 Huntsville MPO Bikeway Plan, and the 2017 Huntsville Downtown Development Strategy. Upon reviewing these previous plans, the following major themes emerged as top priorities as related to this plan:

Safety and Comfort:

Develop facilities for all ages and abilities so all residents feel safe and comfortable when walking and biking

Connectivity:

Connect to main destinations and increase convenience of bicycle and pedestrian travel

Implementation:

Reduce hazards by implementing a "Spot Improvement Program" along major cycling routes and major pedestrian routes **PROPOSED BICYCLE INFRASTRUCTURE**

- Protected cycle track
- Connecting to regional trails
- On street bike lanes





DOWNTOWN MASTERPLAN / HUNTSVILLE, ALABAMA



Proposed Downtown Huntsville Bicycle Infrastructure from the 2017 UDA Huntsville Downtown Development Strategy Plan

Key Opportunities and Constraints

Opportunities

- Existing walking and biking culture
- Supportive infrastructure in place (bike share, greenways, Spragins Ave cycle track) and programming (walking and biking tours)
- Pedestrian Access and Redevelopment Corridor (PARC) RAISE grant project
- Wide roadways with low traffic volumes and speeds = opportunity for road diets and the addition of bicycle/ pedestrian infrastructure
- Traffic signals can be adjusted with relatively low cost changes to improve the walking and bicycling experience.
- Channelized turns can be improved with raised pedestrian crossings to improve visibility of pedestrians, warn drivers, and slow traffic speeds.
- Where crosswalks are not present, adding high visibility crossings are relatively cost effective ways to improve walking and biking safety.



Lowe Ave: A 5-lane road that sees under 5,000 Annual Average Daily Vehicular Trips (AADT) and ideal candidate for a road diet with 3 travel lanes and separated/buffered bike lanes

Constraints

- Downtown is bordered by busy roads with high traffic volumes (Governors Dr, California St, Pratt Ave, and Memorial Pkwy).
- Narrow roads and right-of-ways in some locations will require property acquisition or easements to incorporate new sidewalks.
- Stormwater inlets at intersection corners may create challenges when realigning or adding new crosswalks.



Governors Dr and Lowery Blvd: A busy intersection between downtown, restaurants, medical offices, and Huntsville High School.

Network Recommendations

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Downtown Active Transportation Network

This plan builds upon the active transportation infrastructure as recommended in the previous plans noted on page 7 and adds new infrastructure to create a connected network throughout downtown. As downtown already features a robust sidewalk network, many recommendations include improved bicycle infrastructure. See page 13 for the proposed downtown active transportation network.



Wide sidewalk along the east side of Lowery Blvd

Network Recommendations

The Big Picture

- Create facilities that are comfortable by all ages and abilities to invite residents and visitors to walk and bike more downtown
- Elevate the choice of walking or biking to downtown with improved infrastructure and facilities

This Plan

- Identifies a future, connected system of walking and biking infrastructure into and throughout downtown (See Map on following page)
- Locates spot improvements at major intersections and points leading into downtown, improving bicycle and pedestrian connectivity from nearby neighborhoods

Lane Reconfiguration Example: Georgia Tech Parkway

Creating comfortable walking and biking corridors around and through downtown elevate the choice to walk or bike and will connect residents and visitors to the major downtown destinations, parks, and neighborhoods. The following images illustrate a corridor with a similar cross-section as Lowe Ave and Monroe St and how it was transformed into a walking and biking corridor with dedicated two-way cycle track.



GEORGIA TECH PARKWAY BEFORE: 4-5 travel lanes



GEORGIA TECH PARKWAY AFTER: 2-3 travel lanes and 2-way cycletrack with sidewalk



Downtown Active Transportation Network

Conceptual Active Transportation Network

Typology

- Bike Boulevard
- PromenadeBike Lanes
- Buffered or Separated Bike Lanes
- Shared Use Path

Existing Bicycle and Pedestrian Infrastructure

Туре

- ----- Existing Greenway / Shared use path
- Greenlink
- -- Proposed Greenway
- -- Visionary Greenway



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Short term, Quick Win Projects

Quick Win Projects

A primary goal of this plan is the development of quick-win projects that can be implemented efficiently and bring noticeable improvements to walking and biking infrastructure at major downtown gateways. The project team created a list of potential projects and, through a collaborative effort with City of Huntsville staff, narrowed the projects to nine spot improvements. The following pages provide concept plans and planning-level cost assessments for the projects. See the map on page 17 for the project locations. To see the full list of improvements that were considered, see the Appendix.

Cost Assessment Note

Cost estimates prepared for the projects are based on a feasibility estimate by Alta staff and overall direction from City of Huntsville staff. As no survey or underground utility analysis has been performed, some uncertainty remains. Unit prices for this study were sourced from the ALDOT 2022 bid tabulations. Prices were primarily chosen from the Madison County bid tabulations for pay items with quantity ranges similar to these projects. For pay items that were not available within the Madison County projects, unit prices were chosen from other counties with similar projects and demographics. These unit prices were then averaged and used as the basis for estimates. Overall our project team feels that these costs seem high given the work to be performed, but that they likely represent a safe cost that should not be exceeded unless significant elements are added in future design following the completion of this project.



The intersection of Lowe Ave and Madison St provides an opportunity for a protected intersection with lane reconfiguration and the addition of buffered bike lanes.

Spot Improvement Types

The concept plans include some of the following spot improvement types:

- Signal changes: Leading Pedestrian Intervals (LPIs), No Turn on Red (NTOR), Flashing Yellow Arrow (FYA), and Accessible Pedestrian Signals (APS)
- Striping adjustments / Curb extensions
- Lane reconfigurations
- Protected intersections
- Bike boxes and bike detection
- Two-stage turn box (queue boxes for cyclists to make left turns at multi-lane signalized intersections)
- Smart channels
- New curb ramps and accessibility improvements



Protected intersection example: A new protected intersection near the Memphis Medical District was the result of multiple institutions working together to strengthen the connection between neighborhoods, the Medical District, and downtown. The intersection includes buffered bike lanes, high visibility crosswalks, bike crossing delineation, painted curb extensions, vertical delineators, and pedestrian signals.

Project Locations



pages 40-41 for all recommendations along Pratt Ave NE.

Project A) Governors Dr and Lowery Blvd

As a busy intersection between downtown, restaurants, medical offices, and Huntsville High School, the Governors Dr and Lowery Blvd intersection has the potential to see significant travel on foot or by bike. In fact, high school students often cross Governors Dr to reach commercial destinations on the north side of Governors Dr. The concept plan includes the following improvements to increase pedestrian visibility and enhance the walking and biking experience:

- Provide high visibility crosswalks, improve crosswalk alignment, and upgrade pedestrian accessibility to meet current PROWAG standards.
- Add directional ramps for relocated crosswalks on east and west legs on the south side of the intersection.
- Relocate pedestrian signal locations for increased accessibility.
- Signal is already split phase and separates pedestrians from dual left turns. Adding an LPI is recommended to better treat right turn conflicts.



Project A) Conceptual Cost Estimate

Elements	Estimated			
	Quantity	Unit	Unit Cost	Total Cost
Site work Schedule			****	***
Install Concrete Sidewalk	99	SY	\$194	\$19,206
Install Curb/Curb & Gutter	54	LF	\$80	\$4,320
Traffic Control Markings	856	SF	\$11	\$9,416
Removal of Existing Traffic Control Markings	336	SF	\$6	\$2,016
Removal of Existing Traffic Stripes	289	LF	\$8	\$2,254
Removal of Existing Concrete	58	SY	\$52	\$3,016
Pedestrian Push Button	4	EA	\$2,500	\$10,000
Unclassified Excavation	2	CY	\$1,000	\$2,000
			Site Work Total	\$52,228
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$1,567
Site Restoration (Property, Grading)	1	LS	2%	\$1,045
Traffic Control	1	LS	\$13,235	\$13,235
Geometric Controls	1	LS	3%	\$1,567
Erosion Control & Sediment Control	1	LS	\$4,406	\$4,406
	Subtotal fo	or Miscella	neous Schedule	\$21,819
Engineering Schedule				
Engineering Design	1	LS	10%	\$7,405
Construction Oversight	1	LS	10%	\$5,223
	Subtota	l for Engin	eering Schedule	\$12,628
			Grand Total	\$86,675

Project B) Lowe Ave and Gallatin St

Lowe Ave, a five-lane roadway, sees an average of 5,000 vehicle trips per day. With low traffic volumes, this wide corridor can be transformed into a threelane roadway by removing two travel lanes and converting them to separated/ buffered bike lanes. This increases the walking and biking experience along Lowe Ave, which is already a bike route (#54) and major east-west connection into downtown. With the new roadway cross-section, the intersections along Lowe Ave can become "protected intersections" with new striping to increase bicycle and pedestrian visibility and add new facilities for walking and biking. The next three projects detail these new intersection designs. The intersection improvements shown to the right include:

- Lane reconfiguration on Lowe Ave from 5 to 3 travel lanes
- Add intersection crossing markings for the bike lanes. Adjust turning path of vehicles with painted curb extensions.
- Restrict right turns on red (NTOR) and provide a Flashing Yellow Arrow and a short LPI.



Note: An engineered striping plan along Lowe Ave is recommended to address lane transitions and ensure project quality. The red zone delineates the buffered bike lane; this zone is intended to painted a MUTCD-compliant color of choice. The bike lanes within the protected intersection are recommended to be painted green per FHWA guidance.

Project B) Conceptual Cost Estimate

Flements	Estimated			
Lichichts	Quantity	Unit	Unit Cost	Total Cost
Site Work Schedule for Protected Intersection	-			
4" Traffic stripe	1111	LF	\$2	\$2,222
Bike lane stencil marking	6	EA	\$250	\$1,500
Crosswalks	2212	SF	\$11	\$24,332
Removal of Crosswalks	2212	SF	\$6	\$13,272
Flexible delineators	32	EA	\$35	\$1,120
Green painted bike lane (as shown in concept drawing)	2380	SF	\$10	\$23,800
Painted curb extensions (colored pavement)	3706	SF	\$8	\$29,648
Site Work Schedule for Bike lanes and buffer between intersections				
Bike lane striping between Gallatin St and Madison St	690	LF	\$2	\$1,380
Bike lane buffer striping between Gallatin St and Madison St	690	LF	\$2	\$1,380
Flexible Delineators (average 40' O.C spacing)	18	EA	\$35	\$630
			Site Work Total	\$99,284
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$2,979
Site Restoration (Property, Grading)	1	LS	2%	\$1,986
Traffic Control	1	LS	\$13,235	\$13,235
Geometric Controls	1	LS	3%	\$2,979
Erosion Control & Sediment Control	1	LS	\$4,406	\$4,406
	Subtot	al for Misco	ellaneous Schedule	\$25,584
Engineering Schedule	_			
Engineering Design	1	LS	10%	\$12,487
Construction Oversight	1	LS	10%	\$9,928
	Subt	otal for En	gineering Schedule	\$22,415
			Grand Total	\$147,283

Notes: Cost varies significantly depending on material used for red and green pavement coatings. This estimate assumes durable coatings and may lie on the high end of the spectrum. Curb ramps could use accessibility and location upgrades which would reduce the overall size of the intersection as part of a more complex project.

Project C) Lowe Ave and Madison St

Similar to Project B, the intersection of Lowe Ave and Madison St can be converted to a protected intersection with the addition of new striping and painted curb extensions.

The intersection improvements shown to the right include:

- Lane reconfiguration on Lowe Ave from 5 to 3 travel lanes
- Add intersection crossing markings for the bike lanes. Adjust turning path of vehicles with painted curb extensions.
- Restrict right turns on red (NTOR) and provide a Flashing Yellow Arrow and a short LPI.



Note: An engineered striping plan along Lowe Ave is recommended to address lane transitions and ensure project quality. The red zone delineates the buffered bike lane; this zone is intended to painted a MUTCD-compliant color of choice. The bike lanes within the protected intersection are recommended to be painted green per FHWA guidance.

Project C) Conceptual Cost Estimate

Flowerts	Estimated			
ciements	Quantity	Unit	Unit Cost	Total Cost
Site Work Schedule for Protected Intersection	_			
Install Concrete Sidewalk and Ramps	9	SY	\$194	\$1,746
Install Curb/Curb & Gutter	10	LF	\$80	\$800
4" Traffic stripe	1206	LF	\$2	\$2,412
24" Stop Bar	74	LF	\$10	\$740
Bike lane stencil marking	6	EA	\$250	\$1,500
Crosswalks	2236	SF	\$11	\$24,596
Removal of Stop Bar	74	LF	\$6	\$444
Removal of Crosswalks	2236	SF	\$6	\$13,416
Removal of Existing Concrete	19	SY	\$52	\$988
Unclassified Excavation	0.5	CY	\$1,000	\$500
Flexible delineators	32	EA	\$35	\$1,120
Green painted bike lane (as shown in concept drawing)	2177	SF	\$10	\$21,770
Painted curb extensions (colored pavement)	1748	SF	\$8	\$13,984
Site Work Schedule for Bike lanes and buffer between intersections				
Bike lane striping between Madison St and Franklin St	400	LF	\$2	\$800
Bike lane buffer striping between Madison St and Franklin St	400	LF	\$2	\$800
Flexible Delineators (average 40' O.C spacing)	10		\$35	\$350
			Site Work Total	\$85,966
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$2,579
Site Restoration (Property, Grading)	1	LS	2%	\$1,719
Traffic Control	1	LS	\$12,000	\$12,000
Geometric Controls	1	LS	3%	\$2,579
Erosion Control & Sediment Control	1	LS	\$5,000	\$5,000
	Sub	total for Misc	ellaneous Schedule	\$23,877
Engineering Schedule				
Engineering Design	1	LS	10%	\$10,984
Construction Oversight	1	LS	10%	\$8,597
	S	ubtotal for En	gineering Schedule	\$19,581
			Grand Total	\$129,424

Notes: Cost varies significantly depending on material used for red and green pavement coatings. This estimate assumes durable coatings and may lie on the high end of the spectrum.

Project D) Lowe Ave and Franklin St

As the third protected intersection along Lowe Ave, Franklin St introduces a protected intersection typology at the entrance to a residential street. The protected intersection will improve walking and biking connectivity and slow traffic speeds coming into and traveling through the neighborhood. As Franklin St is proposed as a future bike boulevard and is currently a city bike route (#69), this protected intersection adds to the user comfort and invites more to walk and bike. As was proposed with the other intersections along Lowe Ave, this project includes:

- Lane reconfiguration on Lowe Ave from 5 to 3 travel lanes
- Add intersection crossing markings for the bike lanes. Adjust turning path of vehicles with painted curb extensions.
- Restrict right turns on red (NTOR) and provide a Flashing Yellow Arrow and a short LPI.



Note: An engineered striping plan along Lowe Ave is recommended to address lane transitions and ensure project quality. The red zone delineates the buffered bike lane; this zone is intended to painted a MUTCD-compliant color of choice. The bike lanes within the protected intersection are recommended to be painted green per FHWA guidance.

Project D) Conceptual Cost Estimate

Floments	Estimated			
Elements	Quantity	Unit	Unit Cost	Total Cost
Site Work Schedule for Protected Intersection	_			
Install Concrete Sidewalk and Ramps	12	SY	\$194	\$2,328
Install Curb/Curb & Gutter	12	LF	\$80	\$960
4" Traffic stripe	1048	LF	\$2	\$2,096
24" Stop Bar	63	LF	\$10	\$630
Bike lane stencil marking	6	EA	\$250	\$1,500
Crosswalks	1973	SF	\$11	\$21,703
Removal of Stop Bar	63	LF	\$6	\$378
Removal of Crosswalks	1973	SF	\$6	\$11,838
Removal of Existing Concrete	12	SY	\$52	\$624
Unclassified Excavation	1	CY	\$1,000	\$1,000
Flexible delineators	29	EA	\$35	\$1,015
Green painted bike lane (as shown in concept drawing)	1248	SF	\$10	\$12,480
Painted curb extensions (colored pavement)	825	SF	\$8	\$6,600
Site Work Schedule for Bike lanes and buffer between intersections				
Bike lane striping between Franklin St and California St	3390	LF	\$2	\$6,780
Bike lane buffer striping between Franklin St and California St	3390	LF	\$2	\$6,780
Flexible Delineators (average 40' O.C spacing)	88		\$35	\$3,080
			Site Work Total	\$79,792
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$2,394
Site Restoration (Property, Grading)	1	LS	2%	\$1,596
Traffic Control	1	LS	\$12,000	\$12,000
Geometric Controls	1	LS	3%	\$2,394
Erosion Control & Sediment Control	1	LS	\$5,000	\$5,000
	Sub	total for Misc	ellaneous Schedule	\$23,383
Engineering Schedule				
Engineering Design	1	LS	10%	\$10,318
Construction Oversight	1	LS	10%	\$7,979
	S	ubtotal for Er	igineering Schedule	\$18,297
			Grand Total	\$121,472

Notes: Cost varies significantly depending on material used for red and green pavement coatings. This estimate assumes durable coatings and may lie on the high end of the spectrum. Curb ramps could use accessibility and location upgrades which would reduce the overall size of the intersection as part of a more complex project.

Project E) Lowe Ave and California St

The intersection of Lowe Ave and California St is a primary gateway between the Blossomwood neighborhood and downtown. The intersection should be improved with new crosswalks, ramps, pedestrian signals, and bike boxes to increase the visibility of those walking and biking. As a long term improvement, a sidewalk is recommended along Fraser as it travels through the neighborhood. The concept plan includes the following recommendations:

- Lane reconfiguration along Lowe Ave
- Add crosswalks to all legs and new pedestrian landing areas with ramps at intersection corners.
- Provide Flashing yellow arrow on all legs vs. permissive green.
- At the channelized turn, relocate pedestrian crossing to middle of curve.

Note: An engineered striping plan along Lowe Ave is recommended to address lane transitions and ensure project quality.



Project E) Conceptual Cost Estimate

Elements	Estimated	Unit	Unit Cost	Total Cost
Site Work Schedule	Quantity	Onit	onne cost	
Install Concrete Sidewalk	127	SY	\$194	\$24,638
Install Curb/Curb & Gutter	199	LF	\$80	\$15,920
Inlet Replacement	1	EA	\$10,000	\$10,000
Traffic Control Markings	1787	SF	\$11	\$19,657
Traffic Stripe	600	LF	\$8	\$4,680
Removal of Existing Traffic Control Markings	197	SF	\$6	\$1,182
Removal of Existing Traffic Stripes	979	LF	\$8	\$7,636
Removal of Existing Concrete	62	SY	\$52	\$3,224
Traffic Signs	16	SF	\$50	\$800
Pedestrian Push Button	2	EA	\$2,500	\$5,000
Unclassified Excavation	6	CY	\$1,000	\$6,000
			Site Work Total	\$98,737
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$2,962
Site Restoration (Property, Grading)	1	LS	2%	\$1,975
Traffic Control	1	LS	\$12,755	\$12,755
Geometric Controls	1	LS	3%	\$2,962
Erosion Control & Sediment Control	1	LS	\$5,338	\$5 <i>,</i> 338
Utility Adjustments	1	LS	\$5,000	\$5,000
	Subtotal fo	or Miscella	aneous Schedule	\$30,992
Engineering Schedule				
Engineering Design	1	LS	10%	\$12,973
Construction Oversight	1	LS	10%	\$9,874
	Subtota	for Engir	neering Schedule	\$22,847

Grand Total \$152,576

Project F) Clinton Ave and California St

The intersection of Clinton Ave and California St is major gateway into downtown from the 5-points neighborhood. As Bike Route #51 travels along Clinton Ave, many cyclists use this low traffic road to travel between neighborhoods and downtown. This intersection can be improved with simple striping, bike detection, and pedestrian signals to increase the visibility of pedestrians and cyclists and increase safety through new crossing features. The concept plan includes the following recommendations:

- Add crosswalks to west and south legs.
- Improve curb ramps on three corners to meet current accessibility standards.
- Add pedestrian signals along with APS push buttons.
- Add bike box with bike detection in both directions on Clinton Ave.
- Add a No right turn on red (NTOR) for Clinton approaches.



Project F) Conceptual Cost Estimate

Elements	Estimated	11		Tabal Cash
Site Work Schedule	Quantity	Unit	Unit Cost	Total Cost
Install Concrete Sidewalk	91	sv	\$194	\$17 654
Install Curb/Curb & Gutter	26	IF	\$80	\$2,080
Traffic Control Markings	1397	SE	\$00 \$11	\$15 367
Traffic Strine	1/13	IF	\$8	\$1 1 <i>11</i>
Removal of Existing Traffic Control Markings	173	SE	\$6 \$6	\$726
Removal of Existing Traffic Stripes	286	IF	\$9 \$8	\$2 231
Removal of Existing Concrete	44	SV	\$52	\$2,231
Inlet Protection	2	FA	\$542	\$1 084
Traffic Signs	14	SE	\$50	\$700
Pedestrian Push Button	3	FA	\$2,500	\$7 500
Unclassified Excavation	1	CY	\$1,000	\$1,000.0
			Site Work Total	\$51,774
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$1,553
Site Restoration (Property, Grading)	1	LS	2%	\$1,035
Traffic Control	1	LS	\$13,025	\$13,025
Geometric Controls	1	LS	3%	\$1,553
Erosion Control & Sediment Control	1	LS	\$3 <i>,</i> 885	\$3,885
	Subtotal fo	or Miscella	neous Schedule	\$21,052
Engineering Schedule				
Engineering Design	1	LS	10%	\$7,283
Construction Oversight	1	LS	10%	\$5,177
	Subtota	for Engin	eering Schedule	\$12,460
			Grand Total	\$85,286

Project G) Adams St / McClung Ave / Williams Ave / Echols Ave

This four-way intersection creates a large, irregular space with vegetation at some corners that occasionally block sight lines. There is no current guidance provided to pedestrians on when or where to cross the street. The addition of crosswalks, signage, and signals will help increase visibility of pedestrians. As a long term project, this intersection could be redesigned and simplified to improve functionality and user experience. A design consultant would need to be engaged for alternative configurations. The concept plan provides the following recommendations for this quick-win project:

 Provide curb ramps, crosswalks and pedestrian signals.



Project G) Conceptual Cost Estimate

Elements	Estimated			Tabal Cash
Site Work Schedule	Quantity	Unit	Unit Cost	Total Cost
Install Concrete Sidewalk	124	SY	\$194	\$24.056
Install Curb/Curb & Gutter	135	LF	\$80	\$10,800
Install Concrete Islands	6	CY	\$1,200	\$7,200
Inlet Replacement	1	EA	\$10,000	\$10,000
Traffic Control Markings	726	SF	\$11	\$7,986
Removal of Existing Traffic Control Markings	83	SF	\$6	\$498
Removal of Existing Traffic Stripes	182	LF	\$8	\$1,420
Removal of Existing Concrete	128	SY	\$52	\$6,656
Pedestrian Push Button	6	EA	\$2,500	\$15,000
Unclassified Excavation	5	CY	\$1,000	\$5,000
			Site Work Total	\$88,616
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$2,658
Site Restoration (Property, Grading)	1	LS	2%	\$1,772
Traffic Control	1	LS	\$14,345	\$14,345
Geometric Controls	1	LS	3%	\$2,658
Erosion Control & Sediment Control	1	LS	\$5,252	\$5,252
Utility Relocation/Adjustments	1	LS	\$5,000	\$5,000
	Subtotal fo	or Miscella	neous Schedule	\$31,686
Engineering Schedule				
Engineering Design	1	LS	10%	\$12,030
Construction Oversight	1	LS	10%	\$8,862
	Subtota	for Engine	eering Schedule	\$20,892

Grand Total \$141,194

Project H) Clinton Ave and US-431 Exit Ramp

On the west side of downtown, Clinton Ave is a major east-west connector between downtown, neighborhoods west of Memorial Parkway, Campus 805, and other attractions. With the new Constellation development in progress, increased pedestrian and cycling activity is expected. The concept plan includes formalizing a pedestrian island to provide a designated space for pedestrians and increase visibility. Project recommendations include:

- Create a concrete pedestrian refuge island.
- Add a new pedestrian push button.



Project H) Conceptual Cost Estimate

Elements	Estimated			
Site Work Schedule	Quantity	Unit	Unit Cost	Total Cost
Install Concrete Islands	7	CY	\$1,200	\$8,400
Traffic Control Markings	608	SF	\$11	\$6,688
Removal of Existing Traffic Control Markings	504	SF	\$6	\$3,024
Unclassified Excavation	5	CY	\$1,000	\$5,000
			Site Work Total	\$23,112
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	3%	\$693
Site Restoration (Property, Grading)	1	LS	2%	\$462
Traffic Control	1	LS	\$7,445	\$7,445
Geometric Controls	1	LS	3%	\$693
Erosion Control & Sediment Control	1	LS	\$679	\$679
	Subtotal fo	or Miscella	aneous Schedule	\$9,973
Engineering Schedule				
Engineering Design	1	LS	10%	\$3,308
Construction Oversight	1	LS	10%	\$2,311
	Subtota	l for Engir	neering Schedule	\$5,620

Grand Total \$38,705

Project I) Clinton Ave and US-431 Southbound

This quick-win project continues improvements along the south side of the Clinton Ave corridor. The project includes a formalized, concrete pedestrian refuge and a realignment of the channelized turn into a smart channel design to reduce traffic speeds.

- Create a concrete pedestrian refuge island.
- Add a new pedestrian push button.
- Adjust the channelized turn striping into a smart channel to reduce the turning radius and slow traffic speeds.



Project I) Conceptual Cost Estimate

Elements	Estimated	11	Unit Coat	Tatal Cast
Site Work Schedule	Quantity	Unit	Unit Cost	lotal Cost
Install Concrete Islands	3	CY	\$1,200	\$3,600
Traffic Control Markings	363	SE	\$11	\$3,993
Removal of Existing Traffic Control Markings	74	SE	\$6	\$444
Traffic Signs	16	SF	\$50	\$800
Pedestrian Push Button	1	EA	\$2,500	\$2,500
Unclassified Excavation	3	CY	\$1,000	\$3,000
			Site Work Total	\$14,337
Miscellaneous Schedule				
Mobilization & Demobilization	1	LS	5%	\$717
Site Restoration (Property, Grading)	1	LS	2%	\$287
Traffic Control	1	LS	\$7,445	\$7 <i>,</i> 445
Geometric Controls	1	LS	5%	\$0
Erosion Control & Sediment Control	1	LS	\$137	\$137
	Subtotal fo	or Miscella	aneous Schedule	\$8,586
Engineering Schedule				
Engineering Design	1	LS	10%	\$2,292
Construction Oversight	1	LS	10%	\$1,434
	Subtota	l for Engin	eering Schedule	\$3,726
			Grand Total	\$26,649



Appendix

Spot Improvement Selection Process

Before selecting the nine concept plan locations, intersections into downtown were studied for their potential and need for improvements. The map on the following page illustrates the first round of recommendations which were then discussed and narrowed down to select the concept plan locations. Projects were categorized as short term, long term, and visionary as defined below.

Short Term (1-3 years)

Strategic, quick improvements to intersections are effective measures to improve ease of access, safety, and the experience of walking and biking into downtown. Proposed improvements include:

- Signal changes: Leading Pedestrian Intervals (LPIs), No Turn on Red (NTOR), Flashing Yellow Arrow (FYA), and Accessible Pedestrian Signals (APS)
- Striping adjustments and curb extensions
- Road diets
- Bike boxes and bike detection
- Two-stage turn box (queue boxes for cyclists to make left turns at multi-lane signalized intersections)
- Roundabouts
- Raised pedestrian crossings
- Smart channels
- New curb ramps and accessibility improvements

Long Term (3-10 years) and Visionary (10+ years)

Long term projects may require right-of-way acquisition, major construction, utility relocation, and other costly changes that require further study and coordination. Recommendations include:

- Major intersection redesign and infrastructure relocation
- Projects requiring land acquisition
- Relocation of curbs and gutters

All Spot Improvement Locations



Short Term Project List

- 1. Lowery/Harvard and Governors: Add directional ramps for relocated crosswalks on east and west legs on the south side of the intersection. Pedestrian signal locations may need adjustment. Provide high visibility crosswalks, move stop bars back, and fix crosswalk location. Signal is already split phase and separates pedestrians from dual left turns. Adding LPI is recommended.
- 2. Gallatin and Governors: NTOR blankout signs to be active during potential pedestrian conflicts when buttons are pressed.
 Convert channelized turn islands to smart channel geometry with raised pedestrian crossings.
- > 3. Lowe and Gallatin: Add crosswalk on southern leg, FYA, NTOR, LPI, painted truck aprons on large radii corners.
- 4. Lowe and Franklin: Add FYA and LPI.
- 5. Lowe road diet: Change 5-lane roadway to 3 travel lanes with separated bike lanes on each side.
- 6. Lowe/Fraser and California:

A. Channelized turn: minimum - add crosswalks and warning signage to turn lane. Ideally, move pedestrian crossing to middle of curve and adjust geometry to smart channel geometry.

B. Intersection: Add crosswalks to all legs, Provide Flashing yellow arrow on all legs vs permissive green. Provide a pedestrian landing area with ramps on SE corner. Add RRFB at school crossing location of Bluefield and California

- 7. Adams / McClung / Williams Ave / Echols Ave: Provide curb ramps, crosswalks and pedestrian signals with LPI.
- 8. McClung and California: Provide ADA-complaint ramps, crosswalks, and pedestrian signals with LPI on all legs. Ramps will require full reconstruction of storm drain inlets which are at the apex of the corners.
- 9. Clinton and California: Add crosswalks to west and south legs, add pedestrian signals along with APS push buttons, and add bike box with bike detection in both directions on Clinton.
- 10. Pratt / California / Holmes: Provide diagonal crosswalk and pedestrian signals in that direction. Retime for scramble pedestrian phase to accommodate existing diagonal pedestrian movements.
- > 11. Pratt and Meridian: Provide FYA, LPI, and APS
- 12. Church and Pratt: Add pedestrian warning signs at channelized turn lanes, and if possible, add raised ped crossing over the slip lanes and the addition of LPI on N and S legs.
- 13. Church and Dallas: Remove channelized turn lanes, make intersection smaller, and add crosswalks at least on west and north legs. North leg could have a refuge island in the unneeded left turn lane. This could help connect greenways in the future.
- 14. Monroe and Meridian: Improve warning signage for pedestrians at this location.
- > 15. Holmes and Lincoln: Add curb ramps and crosswalk to south leg to go along with existing pedestrian signals. Increase size

of channelized turn island on NE corner by extending it into the gore area.

- 16. Clinton and Lincoln: Reconstruct all corners with ramps. Add crosswalks to all legs and add LPI.
- > 17. Clinton and 565: Formalize channelized turn islands in gore areas to break up pedestrian crossings.
- 18. Clinton and Memorial Parkway South ramp: Add raised turn channel and modify right turn geometry to smart channel design; or, remove right turn channel and reduce radius dramatically to reduce ped and bike exposure

Long Term Project List

- > 1. Shared use path along Harvard: Replace existing sidewalk and add a 10' shared use path on the east side of the corridor
- > 2. Lowe roundabouts at Gallatin, Madison, and Franklin
- 3. Lowe/Fraser and California: Remove right turn channel on EB approach with reconfiguration of roadway and add bike box (this assumes the road diet on Lowe)
- 4. Adams / McClung / Williams Ave / Echols Ave: Look at new intersection layouts. Potential roundabout/traffic circle. Grades will be challenging
- ▶ 5. Pratt / California / Holmes: Change Holmes to exit only and simplify the intersection
- 6. Pratt Ave sidewalk west of Rice Park: Add new sidewalk along south side of Pratt
- 7. Pratt and Meridian: Add bike turn boxes on Pratt if bike lanes are added. Look at protected intersection as part of intersection reconstruction. Add NTOR, blankout signs, and wider ramps to accommodate Gateway Greenway
- 8. Monroe and Meridian: If Meridian St and Lincoln/Monroe are given road diets, then this intersection could be made much smaller. Perhaps even a roundabout/ peanut about.
- 9. Holmes and Lincoln: (if stays one way): provide protected intersection with two-way cycle track on south side of intersection. Integrate ped refuge islands to shorten crossing distance. Only two through lanes.
- > 10. Shared use path: Provide a connection between the Veteran's Park greenway to Pinhook Creek











Existing Pedestrian Infrastructure