ADA COUNTY HIGHWAY DISTRICT

13th STREET TRAFFIC CALMING CONCEPT STUDY: FORT STREET TO HILL ROAD

Boise, Idaho

ACHD

Committed to Service

This traffic calming concept study and plan was a collaborative effort between the Ada County Highway District and the City of Boise with assistance from HDR Engineering, Inc. Valuable input was contributed to this neighborhood plan by neighborhood residents and the general public.

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13th St. Traffic Calming Concept Studies

13th Street Data Collection, Existing Conditions and Alternatives Concepts

July 3, 2018

Introduction

The Ada County Highway District (ACHD) is seeking to develop a traffic calming concept study for 13th St. from Fort St. to the Hill Road and 15th St. intersection. The purpose of this study is to conduct neighborhood outreach to consider various traffic calming measures along 13th St. This concept study is the result of neighborhood residents reaching out to ACHD, developing and presenting the necessary petitions to initiate an ACHD traffic investigation, and the results of that investigation. A vicinity map and study area is presented in **Figure 1**.

Data Collection

Data Requested From Project Team Members

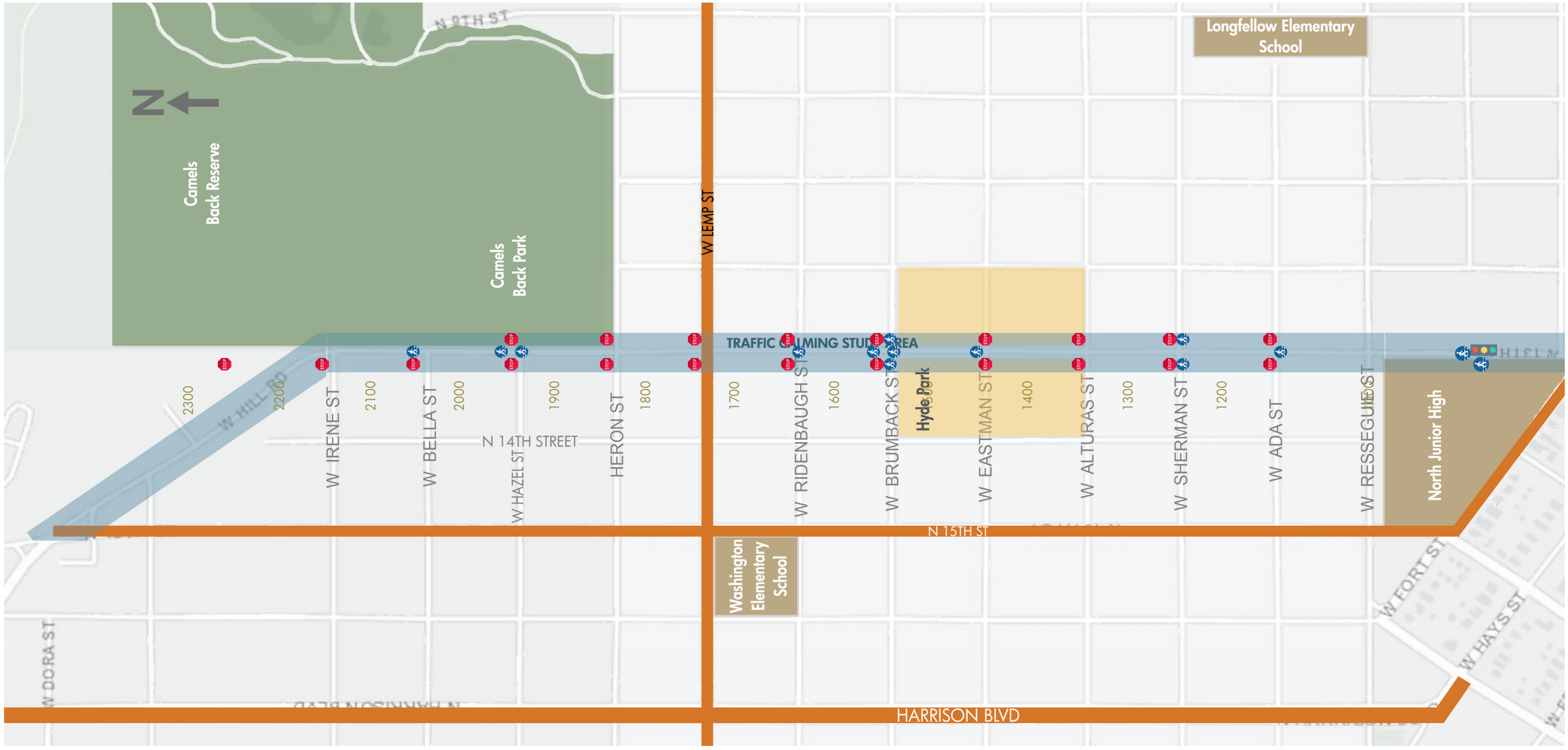
ACHD provided the following data:

- ACHD's completed traffic investigation. It includes:
  - Study period traffic volumes, average daily traffic (ADT) and a.m. and p.m. peak hour volumes
  - Collected vehicular speeds and speed evaluations for the study period
- Police citation data pertinent to the study
- Current right-of-way information in GIS
- Current aerial images for area of study
- Existing storm drain facilities and outfalls within the study area

Data Collected by HDR

- Existing physical conditions, including:
  - Lane configurations and widths
  - Speed limits
  - Curb-to-curb width (measured to the top back of curb)
  - On-street parking locations
  - Sidewalk locations and widths
  - Bicycle facilities and widths
  - Existing intersection configurations and control (stop control, signal control)
  - Crosswalk location and type

Figure 1 **Study Area Map**



Legend

- Signal Control
- Stop Control on side streets
- Marked Pedestrian Crossing

Details of the field review are presented in **Table 2** attached at the end of this memo.

Existing Conditions

Existing Physical Conditions

Posted Speed Limit
The speed limit is posted as 20 miles per hour (mph) throughout the study corridor.

Roadway Widths
13th Street is consistently 34 feet wide from the top of back of curb to the top back of curb, which provides 30 feet of asphalt roadway width from the lip of gutter to the lip of gutter. Variations to this width are found where there are bulb-outs at intersections and the street narrows 24 feet wide from the top of back of curb to the top back of curb, which provides 20 feet of asphalt roadway width from the lip of gutter to the lip of gutter. These bulb-outs are found in the Hyde Park area on the north side of the Alturas St. intersection, on the north and south sides of the Eastman St. intersection, and on the south side of the Brumback St. intersection.

13th St. north of Fort St. widens to 44 feet from top back of curb to top back of curb to develop a southbound left turn lane at the Fort St. intersection.

North of Irene St. the sidewalk on the east side within Camel's Back Park ends and the street includes a 3 foot wide shoulder and then is graded into the adjacent terrain. The asphalt width in this area from where 13th St. transitions into Hill Road up to 15th St. includes a 14 foot wide southbound lane, an 11 foot wide northbound lane, and a 3 foot shoulder.

Right-of-Way Widths
The right-of-way width is 60 feet from Fort St. to Heron St. Along the Camel's Back Park frontage from Heron St. to Irene St. the right-of-way is 40 feet wide and the sidewalk in the park is on the park property. North of Irene St. the right-of-way varies from 40 feet wide to 55 feet wide to 65 feet wide.

Sidewalk Locations and Widths
Sidewalks are consistent along both sides of 13th St. from Fort St. to Irene St. They vary from 5 feet wide to 8 feet wide. Within the Hyde Park area the sidewalks widen to 10 feet and even 15 feet wide in front of the various restaurants, some of which offer outdoor seating. North of Irene St. the sidewalk on the east side ends. The 5 foot wide attached sidewalk on the west side continues along 13th St. and Hill Road all the way to 15th St. Most of the sidewalks in the study area are attached to the curb and gutter with a few areas of detached sidewalk.

Bicycle Facility Locations and Widths
The entire length of 13th St. in the study area includes shared-lane markings or sharrows in each direction where the bicyclists share the travel lane with vehicles.

Transit Facilities and Service

Valley Regional Transit (VRT) operates the Hyde Park Route 14 that provides service from Downtown Boise through the North End to Bogus Basin Road and travels along 13th St. from Fort St. to Brumback St. Bus stops are located at the Fort St., Resseguie St., Sherman St., and Brumback St. intersections.

Summary of ACHD Traffic Investigation

ACHD completed a traffic investigation of this corridor following requests from residents. Vehicle volume counts and radar speed studies were completed at the following locations (results included below):

- North of Fort St. in April 2015
  - ADT = 5,119
  - Peak hour volume = 727 vehicles per hour (vph)
  - Average volume per hour = 213 vph
  - Average speed = 29 mph northbound / 17 mph southbound
  - Peak hour average speed = 25 mph
  - 85th Percentile speed = 35 mph northbound / 22 mph southbound
  - 95th Percentile speed = 39 mph northbound / 24 mph southbound

- North of Fort St. in October 2015
  - ADT = 4,972
  - Peak hour volume = 527 vph
  - Average volume per hour = 207 vph
  - Average speed = 21 mph northbound / 25 mph southbound
  - Peak hour average speed = 23 mph
  - 85th Percentile speed = 24 mph northbound / 30 mph southbound
  - 95th Percentile speed = 27 mph northbound / 33 mph southbound

- North of Ada St. in December 2014
  - ADT = 4,626
  - Peak hour volume = 535 vph
  - Average volume per hour = 193 vph
  - Average speed = 22 mph
  - Peak hour average speed = 22 mph northbound / 23 mph southbound
  - 85th Percentile speed = 26 mph
  - 95th Percentile speed = 28 mph

- South of Bella St. in October 2015
  - ADT = 3,829
  - Peak hour volume = 407 vph
  - Average volume per hour = 160 vph
  - Average speed = 21 mph
  - Peak hour average speed = 18 mph northbound / 17 mph southbound

- 85th Percentile speed = 26 mph
- 95th Percentile speed = 27 mph

ACHD's investigation found that there was substantial support for traffic calming from the residents along 13th St. based on the petition received. The volumes and speeds collected met the traffic calming criteria in place at the time they were collected. These results led to the current 13th St. Traffic Calming Concept Study.

Summary of Citation Data

The Boise Police Department provided citation data for the segment of 13th Street that transitions into Hill Road from Heron Street to 15th Street. During 2016, 2017, and the first 3 months of 2018 there were 184 citations issued to drivers on this segment.

- 153 were at Hill Road and 14th St. (83%)
- 110 citations (60%) were issued for speeds exceeding the maximum posted speed
- 36 citations (20%) were issued for not properly using vehicle safety restraints
  - 31 of those citations (17%) were issued for not properly using vehicle safety restraints with an occupant under 18 years of age
- 24 citations (13%) were issued failing to provide proof of insurance.

Crash Analysis

Crash history data for the years 2011 to 2016 was collected for the corridor. Overall there were 51 crashes along 13th St. Sixteen crashes were injury crashes and 35 crashes were property damage only. The most common types of crashes included angle crashes or angle turning at intersections (15), striking parked cars (14), and struck bicyclists or pedestrians (7). The most common causes of these crashes include failure to yield (14), inattention (11), and failure to obey stop sign (6).

Thirty-two crashes were intersection related with 9 at the Fort St. intersection, 5 at Heron St. intersection, 4 at the Brumback St. intersection, and 4 at the Resseguie St. intersection. The remaining 10 crashes occurred at other intersections. Thirteen crashes not at intersections were struck parked cars and 3 were other struck objects.

The Fort St. intersection crashes included 4 struck bicyclists, 3 head-on turning crashes, and 2 angle crashes. The Heron St. intersection crashes included 1 struck bicyclist, 3 angle crashes, and 1 rear-end crash. The Brumback St. intersection crashes included 1 struck pedestrian crash and 3 angle crashes. The Resseguie St. crashes included 1 struck bicyclist and 3 angle crashes. The crash history is summarized in **Figure 2**. Of the 6 bicycle crashes, 5 were intersection related, and one pedestrian crash was intersection related.

Figure 2

Crash History

From 2011-2016 there were 52 crashes recorded on 13th St., 32 occurring at intersections.

Crash clusters can be seen at:

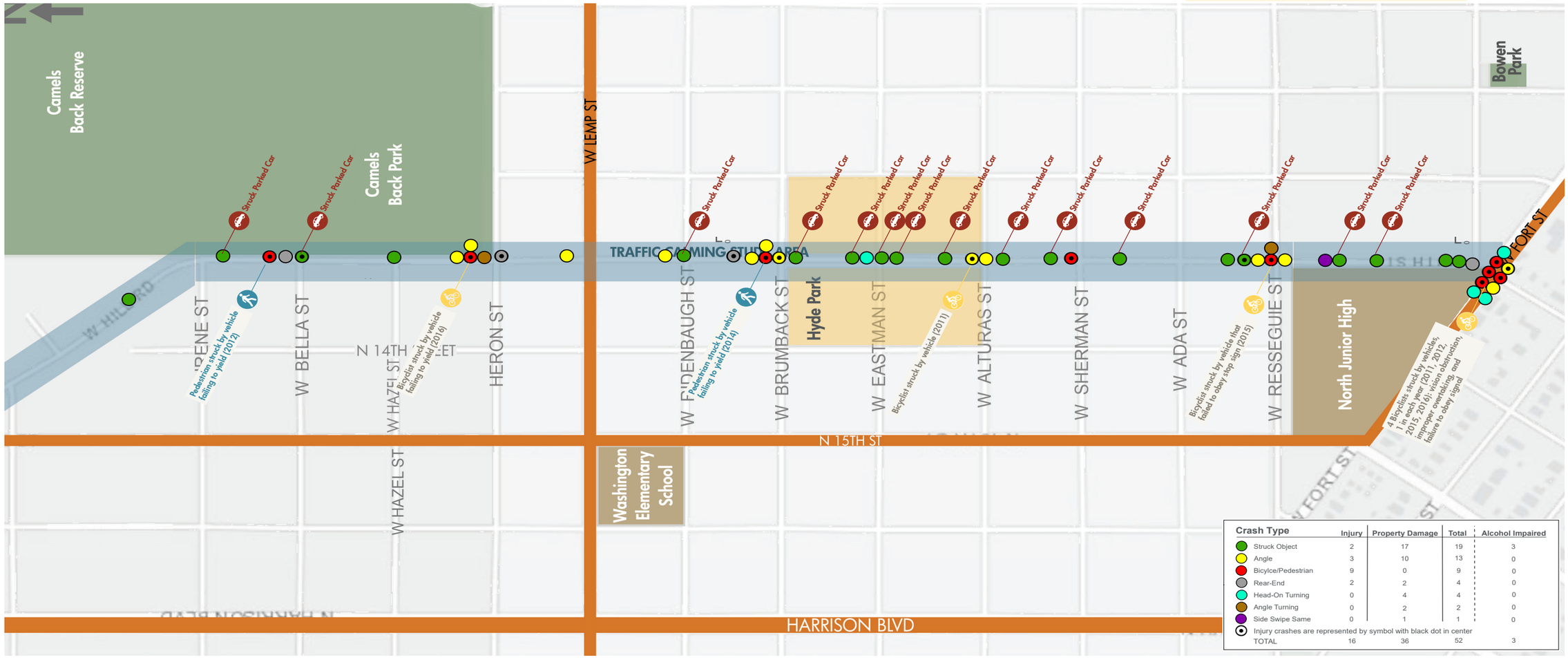
- Fort St. & 13th
- 13th between Resseguie and Ada
- Eastman & 13th
- North of Brumback & 13th
- Heron & 13th

The most common types of crashes in the corridor are:

- Struck objects (mostly parked cars)
- Angle crashes at intersections and driveways
- Bicycle crashes

The most common causes of crashes in the corridor are:

- Failure to yield to pedestrians
- Failure to yield to bicycles
- Failure to yield to other vehicles
- Inattention
- Failure to obey stop signs



Crash Type	Injury	Property Damage	Total	Alcohol Impaired
Struck Object	2	17	19	3
Angle	3	10	13	0
Bicylce/Pedestrian	9	0	9	0
Rear-End	2	2	4	0
Head-On Turning	0	4	4	0
Angle Turning	0	2	2	0
Side Swipe Same	0	1	1	0
Injury crashes are represented by symbol with black dot in center				
TOTAL	16	36	52	3

Public Information Meeting # 1

ACHD held a public involvement meeting (PIM) for this concept study on March 8, 2018. It was an open house with two separate presentations and group breakout sessions facilitated by ACHD and HDR staff. The majority of those attending were residents of the area and the transportation modes they use to travel along 13th St. was fairly even between cars (38), walking (37), and biking (29). Solutions that support and enhance pedestrian visibility and safety were well supported, including bulb outs, moving parking further from the intersections for better sight distances, and mark crosswalks more clearly. More enforcement of the speed limit was also a popular response. Solutions identified as not good fits include speed bumps, traffic signals or stop signs, and widening the street.

A common observation from residents was that traffic was calm through the Hyde Park area but speeds increased as vehicles traveled north and south from this area. The curve at the north end of the study where Hill Road becomes 13th Street was also identified as a high speed area. There is no curb, gutter, or sidewalk on the east side leading to Camel's Back Park and no parking is allowed along the park frontage to Heron St. This wide area makes people feel they have more room and can travel at faster speeds.

Details of the feedback of attendees at the PIM and comments received are presented in **Figure 3**.

Alternative Concept Development & Refinement

Based on the PIM # 1 feedback, the wide range of typical traffic calming treatments, and discussions with the project team, alternative concepts were developed and refined for implementation along 13th St. in the study area.

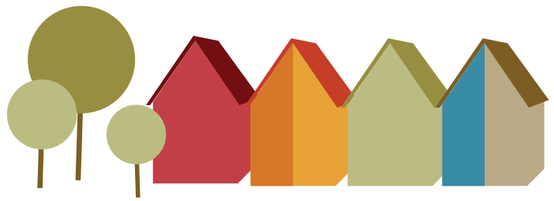
Alternatives Considered But Not Carried Forward

Alternatives considered but not carried forward, along with the reasoning for not moving forward with them, are presented in **Figure 4**.

Figure 3 **Public Meeting #1 Results**

13th Street Traffic Calming Study

Public Involvement Meeting #1
March 8, 2017



OPEN HOUSE

Open House meeting format with two brief presentations followed by facilitated discussion group sessions.

4:30 p.m. session — 8 groups
6:00 p.m. session — 2 groups
75 attendees

Comments

Online	Written	Emails
27	41	14

Is traffic calming necessary?

Yes	No
29	7

> "Problem is with continued building in the foothills is traffic funneling down and through established neighborhoods, like 13th Street."

Primary Reasons for Using 13th Street

45	11	4	24	1	9	11
live in area	commute to/from work	taking kids to/from school	recreation	own/ manage a business on 13th	frequent a business on 13th	other

Solutions we heard that may be a good fit

- Photo radar to catch speeders
- Do nothing—there isn't a problem
- More enforcement of speed limit by police
- Keep it multi-use and make pedestrians more visible
- Make it one-way
- Move bikes to 12th and 14th and add stop signs and bulb outs
- Preserve the historical character of Hyde Park
- Less parking
- Move parking further from intersections to improve sight distance
- Add a stop or signal to make it less of a thoroughfare
- Limit hours for commercial vehicles
- Ticket jaywalkers
- Create more obviously marked pedestrian crossings
- Enforce existing laws on speed and jaywalking
- Turn it into a pedestrian mall

What type of transportation do you typically use on 13th Street?

(choose all that apply)

Car	Bike	Walk
38	29	37

What solutions would NOT be a good fit?

- Speed bumps
- Anything that diverts drivers to adjacent streets
- Stoplights
- Stop signs
- Widening street
- Closing street

> "Traffic calming is a Band-Aid for a much more serious issue (poor growth and development management) that isn't getting addressed in an overall manner by ACHD or the City of Boise"

> "13th Street is a gem of the north end. Any efforts to calm traffic should prioritize pedestrians above all others."

> "Speed bumps are a nuisance....does not decrease speed."

Half dozen comments came from residents of Harrison Boulevard who believe traffic in the area should be addressed holistically as a North End Traffic Plan. Commenters are concerned that any traffic calming solution on 13th Street will create problems on adjacent streets.

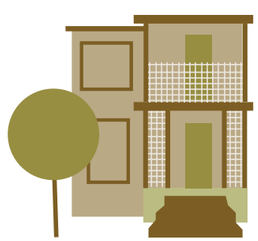
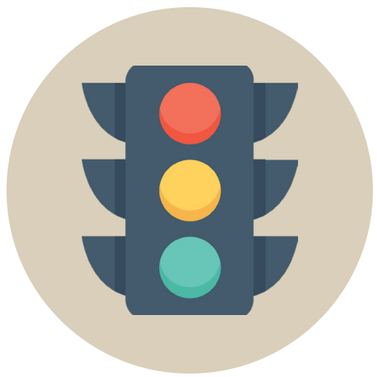


Figure 4

Ideas Considered But Not Moved Forward

Speed Bumps

Not effective unless installed at regular intervals along the street at 300 foot spacing. This is not practical for 13th Street's character or usage.



Traffic Signals

The traffic volumes on 13th Street do not require traffic signal control. Traffic signals would disrupt the flow of traffic on 13th Street and may divert traffic to parallel streets.

Stop Signs on 13th Street Approaches to Intersections

The traffic volumes do not require stop signs on the 13th Street approaches. They would disrupt the flow of traffic on 13th Street and may divert traffic to parallel streets.

Closing 13th Street to Motor Vehicles

Closing 13th is not a viable option for a number of reasons including that it would limit access to existing businesses, homes and Camel's Back Park. It would also divert traffic to adjacent parallel streets causing congestion.

Make 13th Street One-way

This option could potentially increase speeds because two lanes of traffic will be traveling in the same direction. An adjacent parallel street would need to be converted to one way to serve traffic headed the other direction. It is possible this configuration would divert traffic to adjacent streets.

Alternatives Carried Forward

Radar Speed Limit Signs
A radar speed sign is an interactive sign, generally constructed of a series of LEDs that displays vehicle speed as motorists approach. The purpose of radar speed signs is to slow cars down by making drivers aware when they are driving at speeds above the posted limits. They are used as a traffic calming device in addition to or instead of physical devices such as speed humps, speed cushions, speed tables, and speed bumps. Installing these signs at each end of the study area will remind motorists of the speed limit and help slow them down to 20 mph. Proposed approximate installation locations are presented in **Figure 5.**

Bulb Outs
Bulb-outs are an extension of the curb or the sidewalk into the street, usually at an intersection, that narrows the road, inhibits fast turns, and shortens the crossing distance for pedestrians. Some benefits of bulb outs include:

- They slow and calm traffic by narrowing the street width
- They provide space to install ADA compliant pedestrian ramps on existing sidewalks where they are otherwise too narrow
- They provide additional visibility and protection for pedestrians when crossing the street
- They reduce the exposure of pedestrians to vehicular traffic

The bulb outs will remove one parking spot on each side of 13th Street where they are installed. This is so the sight triangle for the vehicles stopped at the cross streets with 13th Street will be improved and drivers waiting to enter or cross 13th Street will have a better view of approaching vehicles and bicycles on 13th Street.

Bulb outs on the 13th Street approaches to intersections were initially recommended for several locations to narrow the street width, reduce pedestrian crossing distance of the street, and improve sight triangles for vehicles stopped on the cross streets at intersections. These address several of the common comments received at and after PIM # 1. As the project team reviewed and discussed the optimal locations, the following locations were identified for bulb out installation:

- The south approach to the 13th Street and Resseguie Street intersection
    - This bulb out is at an existing school crosswalk for North Junior High.
    - A potential rectangular rapid flashing beacon (RRFB) may be included with this installation for enhanced school pedestrian visibility.
- The south approach to the 13th Street and Alturas Street intersection
    - This bulb out is at an existing crosswalk and would mirror the existing bulb out installed on north side of intersection at the south entrance to Hyde Park
    - This bulb out may be installed on the south side of the Sherman Street intersection rather than at the Alturas Street intersection based on public feedback requesting that and the current VRT updates that may update the

prosed bus stop at Sherman Street. This decision will be made during the design phase of project development.

- The north and south approaches to the 13th Street and Heron Street intersection
    - These bulb outs are at existing crosswalks that serve pedestrian traffic to and from Camel's Back Park.
- The north approach to the 13th Street and Hazel Street intersection
    - This bulb out is at an existing crosswalk that serves pedestrian traffic to and from Camel's Back Park.
- The north approach to the 13th Street and Bella Street intersection
    - This bulb out is at an existing crosswalk that serves pedestrian traffic to and from Camel's Back Park. This bulb out will be extended to the south on the east side adjacent to the park to help guide pedestrians to the crosswalk and provide more visibility for pedestrians at the crosswalk.

Proposed installation locations and conceptual layouts are presented in **Figure 5.** All of these bulb outs will help calm traffic at each end of the study area where higher speeds have been documented and reported from several residents and stakeholders.

Cross Section Reduction

The segment of 13th Street that transitions into Hill Road from Heron Street to 15th Street has an issue with drivers traveling over the speed limit. This is attributed to the prohibition against on street parking along the Camel's Back Park frontage of 13th Street and the wider street section from where the sidewalk ends on the east side of 13th Street / Hill Road all the way to 15th Street. Reducing this existing width by adding curb, gutter and sidewalk to provide 11 foot wide shared lanes for vehicles and bicycles will help slow traffic down and will match the character and operations of 13th Street throughout the study area. These improvements are intended to be provided within the existing right-of-way. The proposed installation and conceptual layout, including existing and proposed cross sections, are presented in **Figure 6.**

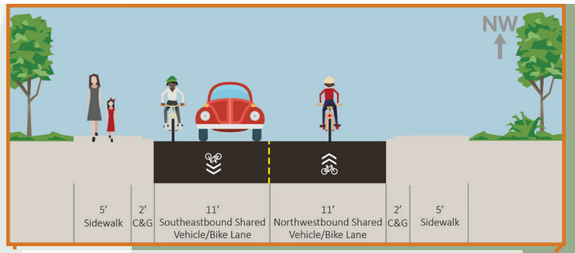
Adjacent Infrastructure Separate Improvements

The existing sidewalk along Camel's Back Park adjacent to 13th Street also serves as the lid to rectangular concrete flume carrying storm water to the north. This flume is relatively old and the lid has several cracks and other issues making it an uneven surface. Replacing this flume lid/sidewalk is difficult and outside this traffic calming concept study requirements. ACHD and the City of Boise are exploring opportunities to improve the flume and accompanying sidewalk. The improvements recommended in this concept study should be designed and constructed in coordination with the flume improvements.

Figure 5

Traffic Calming Implementation Map

Proposed Traffic Calming Concepts



N. 13th St./Hill Road - Irene to 15th Street
Facing Northwest

- Adds curb, gutter, and sidewalk on north side of street
- Narrows southeastbound lane

Camels Back Park

W LEMP ST

TRAFFIC CALMING STUDY AREA

W HILL RD

W IRENE ST

W BELLA ST

N 14TH STREET

W HAZEL ST

HERON ST

W RIDENBAUGH ST

W BRUMBACK ST

Hyde Park

W EASTMAN ST

W ALTURAS ST

W SHERMAN ST

W ADA ST

W RESSEGUIE ST

North Junior High

W FORT ST

N 15TH ST

Bowen Park

Bus Stop

Bus Stop

Bus Stop

Bus Stop

SPEED LIMIT 20 YOUR SPEED 21

Radar speed limit sign (already installed)

SPEED LIMIT 20 YOUR SPEED 21

Radar speed limit sign (already installed)

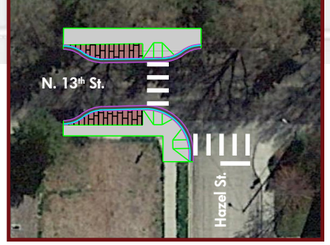
How will parking be impacted by installing bulb-outs?

- One parking spot on each side of 13th Street will be removed for each bulb-out installation.
- This will allow the pedestrians at the intersection to be more visible to vehicles approaching on 13th Street.
- It will also improve the sight distance for vehicles at the cross streets

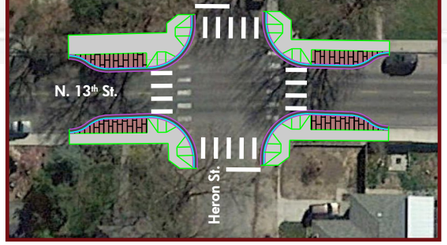
Design of bulb outs and materials used will be determined during the design phase of development.

N. 13th St. & Bella St.
Bulb-out installed on north side of intersection and extend to the south side of the intersection along the park frontage

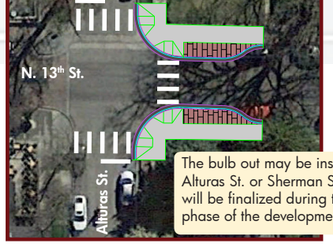
N. 13th St. & Hazel St.
Bulb-out installed on north side of intersection



N. 13th St. & Heron St.
Bulb-outs installed on north and south sides of intersection

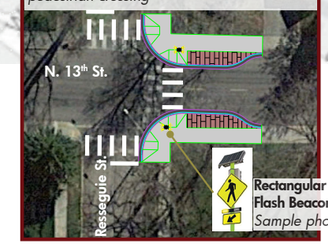


N. 13th St. & Alturas St. or Sherman St.
Bulb-out installed on south side of intersection (bulb-out already installed on north side)



The bulb out may be installed at Alturas St. or Sherman St. This decision will be finalized during the design phase of the development

N. 13th St. & Resseguie St.
Bulb-out installed on south side of intersection with potential RRFB for enhanced school pedestrian crossing

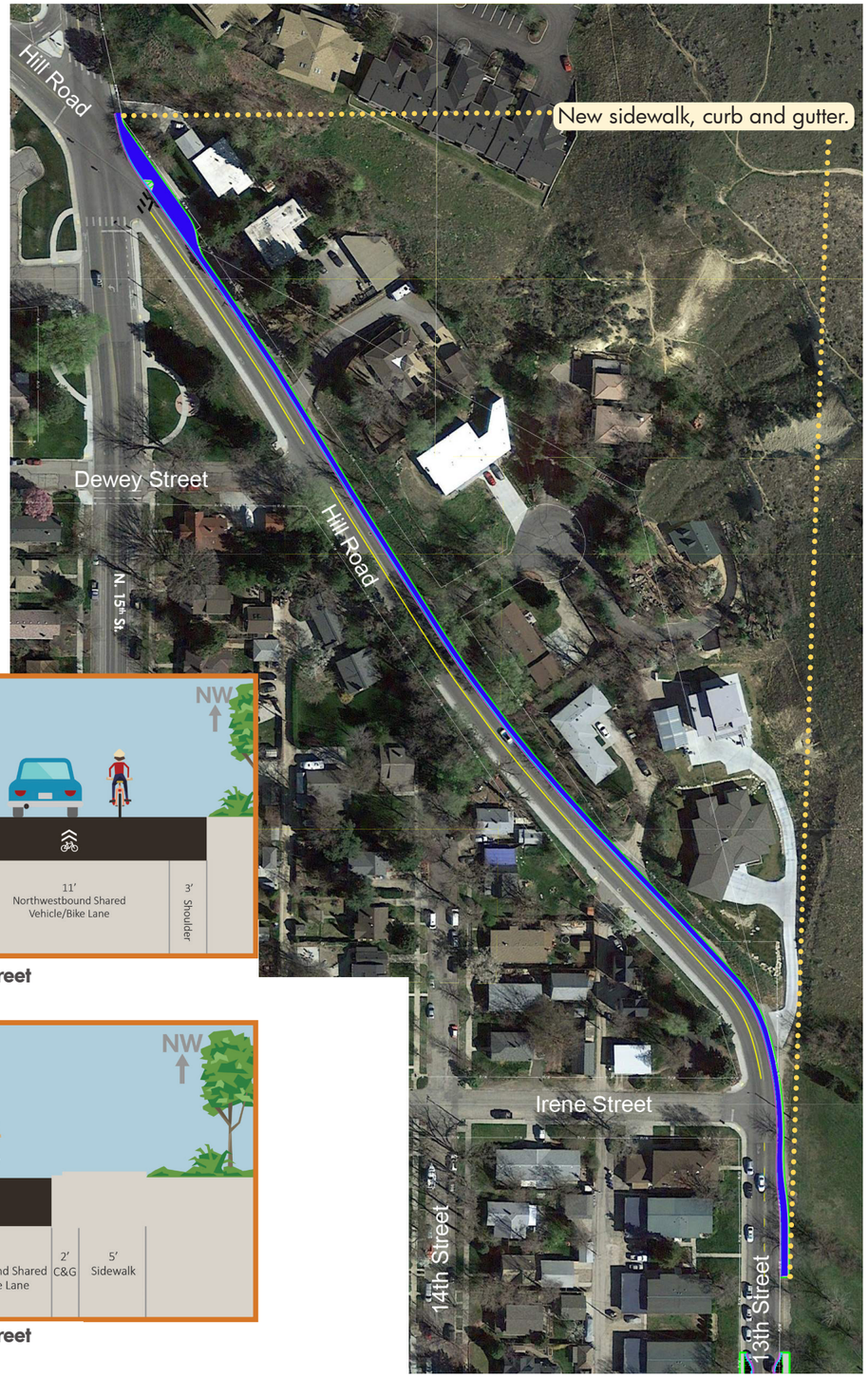


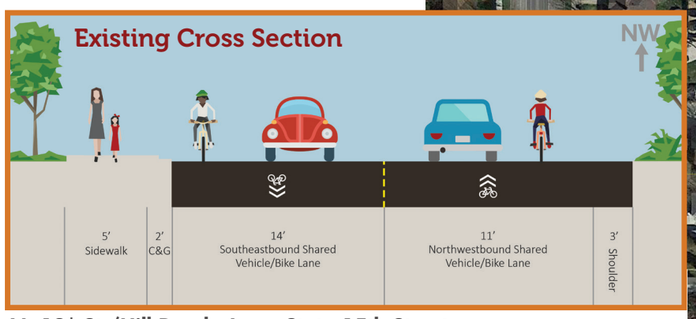
Rectangular Rapid Flash Beacon (RRFB)
Sample photo

Figure 6

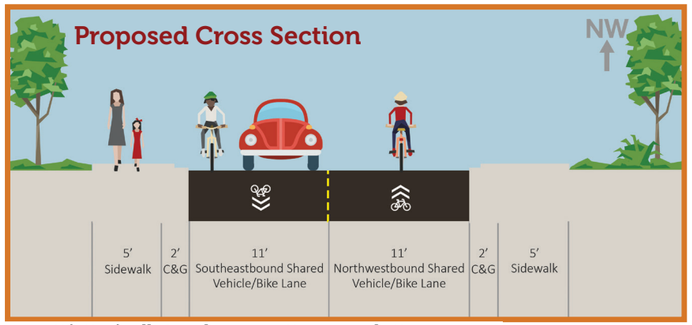
Cross Section Reduction from Irene St. to 15th Street

Proposed 13th Street/Hill Road Traffic Calming





N. 13th St./Hill Road - Irene St. to 15th Street
Facing Northwest



N. 13th St./Hill Road - Irene St. to 15th Street
Facing Northwest

Public Information Meeting # 2

ACHD held the second PIM for this concept study on May 22, 2018. It started with a walking tour that began at the intersection of 13th Street and Heron Street. Seventeen citizens arrived and received handouts showing the proposed traffic calming features recommended for implementation along 13th Street as depicted in **Figures 5 and 6**. ACHD and HDR staff accompanied the citizens on the tour and stopped at the various implementation locations to discuss how they would be installed and receive feedback. The walking tour ended at North Junior High where a pop-up meeting was set up with larger displays of the proposed installations, study background, discussion of the concepts not carried forward, and the information from PIM # 1 shown in **Figure 3**. These that attended generally agreed with the proposed traffic calming concepts and provided comments on specific ways and/or locations to install bulb out. Details of the feedback of attendees at the PIM and comments received are presented in **Figure 7**.

Estimated Costs

A conceptual cost estimate for the proposed traffic calming concepts for 13th Street is presented in **Table 1**. The cost estimates are based on several assumptions, concept level layouts and quantities, and 2018 prices. They are broken out separately for the bulb out installations and the new sidewalk along Hill Road. Materials for developing these improvements were assumed to generate a conceptual cost estimate. Specific design layouts, components, and materials will be determined during the design phase of project development and costs will be refined and adjusted during that phase.

Next Steps

ACHD staff will present the recommended traffic calming concepts to the ACHD Commission for consideration and review. After this presentation, the concepts will be presented to the Boise City Council. Once all comments have been addressed, the ACHD Commissions will consider adoption of the 13th Street Traffic Calming concepts. If approved by the Commission, design will start on the concepts in the fall of 2018.

Figure 7

Public Meeting #2 Results

13th Street Traffic Calming Study

Public Involvement Meeting #2
May 22, 2018

4:30 p.m. - Walking Tour (met at 13th & Heron) **17** attendees

5:30 p.m. - 6:30 p.m. - Open House (held in front of North Jr. High) **20** attendees

Project displays were posted on a Commuteride Van

"I like the installation of sidewalks on the north/east side coming around the curve from Camels Back and Hill Road."

"...bulb-outs are a nice solution. The biggest problem on 13th is the intersections. Visibility is a real problem for pedestrians and cars entering 13th."

Comments

15 Written

2 Emails

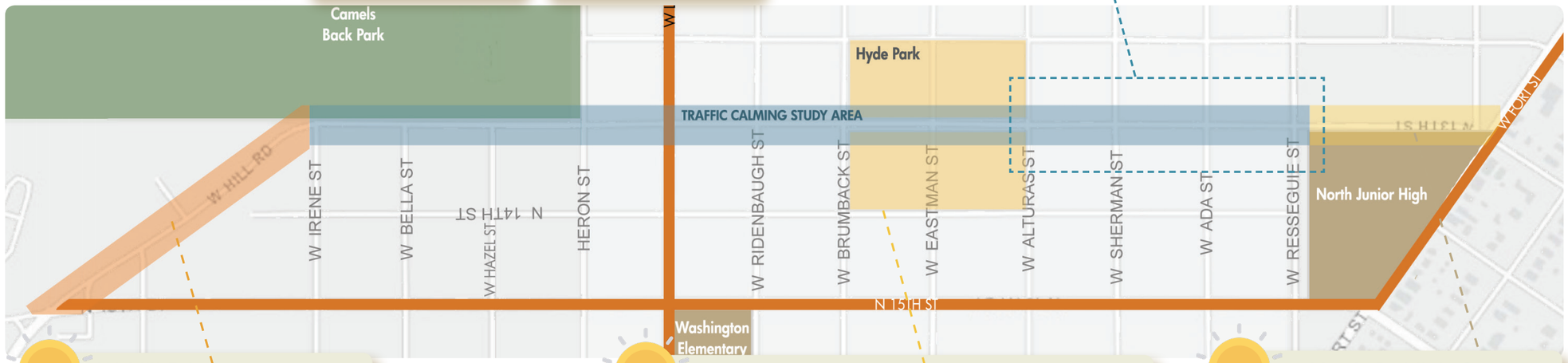
Comments are summarized in the callouts with the light-bulb icon.

Bulb-out Comments

- Bulb-outs should have landscaping which is maintained by North End Neighborhood Association
- Concerns about conflicts when trucks and bikes meet at bulb-outs
- Evaluate effectiveness of temporary improvements before permanent installation

Alturas to Resseguie Area Comments

- In addition to the recommendations, more bulb-outs or traffic calming measures are needed in this area
- Radar sign would be better in this area
- Recommend traffic islands at Ressgeuie and/or Ada and/or Eastman



W. Hill Rd. Comments

- Intersection at Irene & !3th has a blind turn from Hill that seems dangerous
- Radar speed signs are needed on both sides of street

Hyde Park Comments

- Bike parking is difficult during summer—please consider bike corrals in bulb-outs
- Stripe lines since motorists don't recognize bricks as crosswalks
- Concerned about bulb-outs taking away valuable parking spaces
- Diagonal sidewalk ramp on east side of Alturas needs correcting

North Jr. High Comments

- Add another pedestrian crossing in front of North Jr. High
- Can bus parking be moved to the back of North Jr. High to reduce traffic on 13th?

Table 1. 13th Street Recommended Traffic Calming Conceptual Costs

Bulb Out Installation					
ISPWC Bid Item	**Description**	**Units**	**Quantity**	**Unit Price**	**Cost**
201.4.1.A.1	Clearing and Grubbing	LS	1	$5,000	$5,000
201.4.1.C.1	Removal of Obstructions	LS	1	$2,500	$3,000
706.4.1.A.5	Standard 6" Vertical Curb & Gutter	LF	925	$25	$24,000
706.4.1.E.1	Concrete Sidewalk, 5" Thick	SY	645	$70	$46,000
706.4.1.H.1	Pedestrian Ramp with Detectable Warning Domes, Type A	EA	22	$2,000	$44,000
1103.4.1.A.1	Construction Traffic Control	LS	1	$5,000	$5,000
1131.01.01.A	Rectangular Rapid Flashing Beacon - Complete	LS	1	$20,000	$20,000
1134.03.21	Pavement Markings (Paint)	SF	80	$1	$1,000
1134.05.18	Pavement Markings (Thermoplastic)	SF	1,510	$10	$16,000
1135.01.01	Roadside Traffic Sign Installation (One Metal Post)	EA	28	$100	$3,000
1135.01.05	Furnish Roadside Sign Face	SF	110	$15	$2,000
2010.4.1.A.1	Mobilization	LS	1	$19,000	$19,000
SP 07013	Patterned Concrete	SY	292	$50	$15,000
SP XXXXX	Radar Speed Limit Signs	EA	2	$3,000	$6,000
	Design	LS	1	$50,000	$50,000
				Subtotal	**$182,000**
	Contingency - 20%	LS	1	$52,000	$52,000
				Total	**$311,000**
New Sidewalk along Hill Road					
ISPWC Bid Item	**Description**	**Units**	**Quantity**	**Unit Price**	**Cost**
201.4.1.A.1	Clearing and Grubbing	LS	1	$5,000	$5,000
201.4.1.C.1	Removal of Obstructions	LS	1	$2,500	$3,000
706.4.1.A.5	Standard 6" Vertical Curb & Gutter	LF	1,366	$25	$35,000
706.4.1.E.1	Concrete Sidewalk, 5" Thick	SY	916	$70	$65,000
706.4.1.H.1	Pedestrian Ramp with Detectable Warning Domes, Type A	EA	1	$2,000	$2,000
801.4.1.B.1*	6" Minus Uncrushed Aggregate Base	TN	277	$12	$4,000
802.4.1.B.1*	Crushed Aggregate for Base, Type I	TN	92	$20	$2,000
810.4.1.A.1*	Plant Mix Pavement, 4" thickness	TN	61	$90	$6,000
1103.4.1.A.1	Construction Traffic Control	LS	1	$7,500	$8,000
1134.03.21	Pavement Markings (Paint)	SF	200	$1	$1,000
1135.01.01	Roadside Traffic Sign Installation (One Metal Post)	EA	2	$100	$1,000
1135.01.05	Furnish Roadside Sign Face	SF	40	$15	$1,000
2010.4.1.A.1	Mobilization	LS	1	$14,000	$14,000
	Design	LS	1	$30,000	$30,000

				Subtotal	**$177,000**
	Contingency - 20%	LS	1	$36,000	$36,000
				Total	**$213,000**
			Overall Total		**$524,000**

Assumptions

- All prices in 2018 dollars
- *Assume 4" of asphalt, 6" of 3/4" crushed aggregate for base, and 18" of uncrushed aggregate for base
- All stop bar and pedestrian crossing pavement markings at bulb out intersections will be replaced
- No intersection layouts or calculations have been completed.
- Two new signs will be installed on each side of each street for each bulb out for parking
- Half of the signs will be 12" x 18" and the other half will be 30" x 30"
- Traffic control is assumed to be 2.5% of the materials total

N. 13th Street Traffic Calming Study
Table 1. Field Review

Date Data Collected: 5-Feb-18 **Weather Conditions:** Cloudy, warm
Collected by: J. Peetz
Corridor: N. 13th St., W. Fort St. to Hill Road

Cross Street	Speed limit (mph)	Intersection Control	Left turn bays present? Length?		Street Width (top of curb to top of curb) (ft)		On-street parking allowed? Time limit?		Sidewalk present? Attached or detached? Width?		Crosswalks present? Type?				Pedestrian ramps present? Type?				Bicycle facilities present? Type?				ROW		ROW Behind Sidewalk/curb		Stormwater Facilities
			South	North	South	North	South	North	South	North	South	North	East	West	South	North	East	West	South	North	East	West	North	South	North	South	Comments
W. Fort St.	20	Traffic Lights	Y 70'	y 88'	44	44	y	N	Y 6' both sides	8' both sides	yes painted stripes	yes painted stripes	yes painted stripes	yes painted stripes	Y	Y	Y	Y	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	N/A	79'	N/A	W-0' E-3'	Inlet NE, NW, & SE corners, 2 manholes in north half of intersection
Ofarrell St.	20	Stop on Ofarrell	N	N	44	44	N	no parking west side, 1 hour on	Y sidewalk varies (corner)	Y 6'east/ 8' west	Y	N	Y	N	Y	N	Y	N	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	61'	N/A	W-6' E-5'	N/A	Inlet NE corner
W. Resseguie St.	20	Stop on Resseguie	N	N	34	34	Y,N	Y,N	Y 8' west/5' east	Y 8' west/5' east	Yes Painted stripes	N	yes painted stripes	yes painted stripes	Y	Y	Y	Y	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	58'	62'	W-5' E-0'	W-5' E-5'	Inlets in NE, NW, & SE corners, Manhole in center of intersection
W. Ada St.	20	Stop on Ada	N	N	34	34	Y,N	Y,N	y 8' west side; 6' east side	Y 6' bothsides	N	N	yes painted squares	yes painted squares	Y	Y	Y	Y	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	58'	58'	W-5' E-0'	W-5' E-0'	none
W. Sherman St.	20	Stop on Sherman	N	N	34	34	Y,N	Y,N	y 8' west side; 5' east side	y 5' both sides	N	N	N	N	Y	Y	Y	Y	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	58'	58'	W-5' E-0'	W-5' E-0'	none
W. Alturas St.	20	Stop on Alturas	N	N	34	34	Y,N	Y,N	Y 10'-15' west side 5' east	Y 5' both sides	N	N	N	N	SE Corner	NE Corner		Y west side for N/S movement	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	58'	58'	W-0' E-0'	W-0' E-0'	none
W. Eastman St.	20	Stop on Eastman	N	N	24 curb bulb-out at intersection	24 curb bulb-out at intersection	Y,N	Y,N	Y west side 1'	Y 10'-15' to Alturas	N	N	N	N	SE Corner	NE Corner	SW Corner	NW Corner	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	57'	58'	W-0' E-0'	W-0' E-0'	none
W. Brumback St.	20	Stop on Brumback	N	N	34	34	Y,N	Y,N	Y west side 5'	Y 5' both sides	N	N	N	N	Y	Y	Y	Y	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	57'	57'	W-2' E-0'	W-0' E-0'	Inlets in NE, NW, & SE corners, Manhole in center of intersection
W. Ridenbaugh St.	20	Stop on Ridenbaugh	N	N	34	34	Y,N	Y,N	Y west side 5'	Y 5' both sides	N	N	N	N	Y	Y	Y	Y	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	55'	57'	W-8' E-0'	W-3' E-0'	Inlets NE & NW corner, Manhole center of intersection

N. 13th Street Traffic Calming Study
Table 1. Field Review

Date Data Collected: 5-Feb-18 **Weather Conditions:** Cloudy, warm
Collected by: J. Peetz
Corridor: N. 13th St., W. Fort St. to Hill Road

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			South	North	South	North	South	North	South	North	South	North	East	West	South	North	East	West	South	North	East	West	North	South	North	South	Comments
W. Lemp St.	20	stop on Lemp	N	N	34	34	Y,N	Y,N	Y west side 5'	Y 5' both sides	N	N	N	N	SW Corner	NW Corner	NE Croner	Y	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	55'	55'	W-8' E-0'	W-7' E-0'	none
W. Heron St.	20	Stop on Heron	N	N	34	34	y,n	no Parking east side	Y west side 5'	Y 5' both sides	yes painted stripes	yes painted stripes	N	N	SW Corner	NW Corner	NE Croner	SE Corner	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	40'	55'	W-4' E-0'	W-8' E-0'	Manhole & Inlet NE corner Heron
W. Hazel St.	20	Stop on Hazel	N	N	34	34	y,n	no Parking east side	Y west side 5'	Y west side 5'	N	yes painted stripes	N	N	SW Corner	NW Corner	N		Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	40'	40'	W-5' E-0'	W-5' E-0'	none
W. Bella St.	20	Stop on Bella	N	N	34	34	y,n	no Parking east side	Y west side 5'	Y west side 5'	N	yes painted stripes	N	N	SW Corner	NW Corner	N		Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	40'	40'	W-6' E-0'	W-5' E-0'	none
W. Irene St.	20	Stop on Irene	N	N	34	32	Y,N	no Parking east side	Y west side 6'	Y west side 5'	N	N	N	N	yes yellow bumpy ones west	yes yellow bumpy ones west	N	N	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	Bikes use full lane in street	42'	40'	W-8' E-0'	W-5' E-0'	none