



8 E Broadway, Suite 203 Salt Lake City, UT 84111 (801) 746-1435 www.altaplanning.com

To: Jim Price, Mountainland Association of Governments

From: Dave Foster, Alta Planning + Design

Date: 06/21/18

Re: Interlaken Drive Traffic Calming

Interlaken Drive Traffic Calming Controls

Introduction:

Interlaken Drive is a main arterial roadway for many residents of the town of Interlaken, a community nestled adjacent to Utah's Heber Valley. There have been residents reports of speeding along Interlaken Drive, particularly along the downhill turn between E. Saddle Drive and St. Mortiz Road. This specific ½ mile section of Interlaken Drive has an average 8.4% slope which contributes to speeding issues. Roadway width varies between 26- and 28-feet. Listed below are potential design solutions that would slow downhill traffic to decrease speeding and increase safety on Interlaken Drive. These potential countermeasures were selected to work with the roadway's steep gradient and winter-plowing parameters.

Potential Traffic Calming Measures:

1. Speed Feedback Signs

The simple addition of radar speed controlling signs has proven success in alerting drivers of their excessive speeds, in turn slowing them down. Some instances of installation have yielded speed reductions from between 4.62-7.15%, which is directly correlated with fewer crashes. The implementation of speed feedback signs is also proven to be effective in calming traffic for prolonged periods of time. Due to the difference between downhill and uphill traffic speeds on Interlaken Drive, a single sign that alerts downhill traffic of speeding violations will be the most effective use of this traffic calming method. The placement of the sign should be at the point of curvature of the main turn and is indicated by the red circle in Image 2.

The implementation of the speed feedback sign should be approximately 5 feet from the edge of the road and should



Image 1: Radar speed feedback sign



Image 2: Optimal location for Speed Feedback
Sign

be between 7 feet and 10 feet above the ground.⁴ The signage itself should be 15 inches in width. Depending on the sign purchased, indicators can range from flashing blue and red strobe lights, to messages of," SLOW DOWN," "TOO FAST," or "SHARP CURVE," etc. Most are effective in grabbing the driver's attention, without being too distracting from the road. Several brands of speed radar signs allow for Traffic Data Reporting, which can be an effective way to capture traffic data for Interlaken Drive. ⁵

<u>Cost</u>: Speed radar signs can cost between \$1,900-\$3,200 for the sign itself, with total costs ranging between \$5,000-\$12,000.⁶ Prices vary depending on if the sign is powered through direct AC, battery, or onsite solar energy capture.

<u>Maintenance</u>: The upkeep of speed feedback signs is dependent on the type of sign installed. They are designed to last anywhere between five to fifteen years, depending on brand and type of installation. Several brands often include a two-year warranty to cover parts and labor costs within a specific time period.

2. <u>Dynamic Curve Warning Signs</u>

Dynamic curve warning systems are an enhancement on static curve warning signage. These systems add supplemental beacons and/or messages that activate when a motorist approaches the curve at high speed. These systems may use loop detectors or radar to measure the speed of approaching vehicles. Dynamic signs have been shown to have higher compliance than static curve warning signs and are recommended in areas where static signs have failed to address safety issues. Studies have found a 5-7% crash reduction when installed in high crash horizontal curves, that 68% of drivers reduce their speed when approaching a curve with a dynamic curve warning system, and overall speed reductions between 1.8-3 mph.⁷ This is in contrast to adding non-dynamic flashers to a curve warning sign, which reduce speeds by 1 mph. Although Interlaken Drive is not a high crash corridor, a dynamic curve warning system could reduce speeding on the downhill approach to E Saddle Drive.



Image 3: One type of dynamic curve warning system

Dynamic curve warning signs should be located in the same manner as speed feedback signs: 5 feet from the curb of the road and 7-10 feet above the ground.⁴ Systems can range from flashing yellow beacons, to messages such as "SPEED TOO FAST FOR CURVE," or "REDUCE YOUR SPEED TO XX MPH," or fully illuminated signs that are activated when a vehicle is approaching at high speeds, as seen in Image 3.

<u>Cost</u>: Dynamic curve warning generally cost between \$2,200-\$10,000 per sign.^{3, 6} Prices vary depending on specific design and availability of a power source.⁷

Maintenance: Maintenance needs will vary depending on the specific sign selected. Signs are generally designed to last anywhere between five to fifteen years, depending on brand and type of installation.

3. Painted Medians and Lane Striping

Painted medians and edge line striping to indicate lanes of traffic are a low cost and easily implemented method found to slow vehicular traffic.⁶ The visual impact of dividing lanes to a road makes the driver more aware of the road's median and limits them from crossing onto the other lane of traffic. The addition of a centerline to the large curve on Interlaken Drive will likely remind drivers to slow down by reducing their speed in order to properly stay in their lane. According to the Federal Highway Administration, the addition of painted medians on rural and urban roads can reduce fatal crashes by 20%.6 Recommended lane size for each direction of traffic is 11 feet with a 3-foot painted median and 2-foot shoulders at E Saddle Drive that narrow to a standard centerline at the canal where the street changes to 22 feet wide.



Image 4: Widths of Interlaken Drive

<u>Cost</u>: The price of applying centerline and shoulder striping can be as low as \$0.10 per linear foot for paint or \$1-\$2 per linear foot for wet reflective tape. Total striping costs are generally less than \$2,500. Painted median costs are typically between \$10,000-\$30,000.6

Maintenance: Depending on the materials used, maintenance can be required from every six months to seven years. 8



Image 5: Painted Median

4. Gateway Medians

Gateway Treatments utilize aesthetic landscaped medians and signage to indicate the entrance of a community area while also reducing traffic speed. The landscaping design utilized at the intersection of E Saddle Drive and Interlaken Drive could be continued onto Interlaken Drive. A gateway median, of dimensions illustrated in Image 6, could be constructed to reduce traffic speeds by narrowing the street. When more than one median is used, the traffic calming effect is more likely to be achieved.⁹ Due to the slope of the roadway and potential for treacherous winter-



Image 6: Landscape Median Example Dimensions

driving conditions, medians should be landscaped with low or perennial material that does not pose a hazard to motorists. Trees should not be placed in medians.

<u>Cost</u>: The construction of landscaped medians cost on average \$8.00 per square foot to construct, and \$4.00 to irrigate each square foot of landscaping.¹⁰

<u>Maintenance</u>: The required up keep of this landscaped median will vary based on the type of landscaping and vegetation used.

Other Considered Treatments:

Given the relatively steep nature of Interlachen Drive, many traditional traffic calming strategies were deemed unsuitable. Winter maintenance requirements eliminated most vertical traffic calming strategies from consideration. While speed humps are typically effective on more gently sloping roadways, they have proven ineffective on slopes greater than 8%. Other strategies such as yield points or chicanes were not appropriate given the curve of the roadway at this location.

References:

- 1. Effective Deployment of Radar Speed Signs: Federal Highway Administration, Veneziano, D., Hayden L, Ye, J. (December, 2010). Retrieved from:
 - https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa1304/resources2/37%20-%20Effective%20Deployment%20of%20Radar%20Speed%20Signs.pdf
- 2. Study: Are Radar Speed Signs Effective? Trafficalm. (2014, September 03). Retrieved from: http://trafficalm.com/traffic-impact-study-radar-speed-signs-effective/
- Spotlighting Speed Feedback Signs. (n.d.). Retrieved from: https://www.fhwa.dot.gov/publications/publicroads/16marapr/04.cfm

- 4. Best Practices for Radar Speed Sign Installation. (n.d.). Retrieved from: https://www.radarsign.com/bestpractices-for-radar-speed-signs-installation/
- 5. Full Matrix Radar Speed Sign | Full Matrix Radar Speed Display. (n.d.). Retrieved from: https://www.radarsign.com/radar-speed-signs/tc-600-full-matrix-radar-speed-sign/
- 6. Factors Influencing Operating Speeds and Safety on Rural and Suburban Roads. (2015, January). Retrieved from: https://www.fhwa.dot.gov/publications/research/safety/15030/009.cfm
- 7. Low-Cost Treatments for Horizontal Curve Safety 2016. (2016, January). Retrieved from: https://safety.fhwa.dot.gov/roadway_dept/horicurves/fhwasa15084/ch4.cfm
- 8. Maintenance of Pavements, Lane Markings, and Roadsides: Transportation Research Record. (n.d.). Retrieved from: https://safety.fhwa.dot.gov/roadway_dept/night_visib/pavement_visib/docs/trr1334.pdf
- 9. Federal Highway Administration Course on Bicycle and Pedestrian Transportation. (n.d.). Retrieved from: https://safety.fhwa.dot.gov/ped_bike/univcourse/pdf/swless11.pdf
- 10. Roadway Improvements Cost Estimates (n.d.) Retrieved from: https://www.citrusheights.net/DocumentCenter/View/441/Appendix-A-5-Roadway-Improvement-Cost-Estimates-PDF

Interlaken Planning Commission Report Thru 2018-07-02

To: Interlaken Planning Commission

From: Epic Engineering (Joe Santos)

General Comments:

- 1. Meeting(s)
 - 1.1. Planning Commission Meeting
- 2. Key Task(s)
 - 2.1. Approval of Permit Requests
 - 2.2. Update members of outstanding permits
- 3. Key Schedule(s)
 - 3.1. N/A
- 4. Item(s)
 - 4.1. N/A



Project / Task(s)			Responsible Party	Projected Completion Date	Completion Date	
Modi	ified/Changed Dates in Red	Requir	ed/Requested Information in Orange	Comple	eted/Old Task	cs in Grey
General	Water Rights					
		2016/2017	Preparing update on transfer recommendation.	Epic		
	Conference Call and Prepare Amended Memo	7/25/2017	To clarify the confusion surrounding Town water rights, conference call was held with PC member Bill Goodall, Don Olsen of Epic, Lindsay Minck of Epic, Josh Call of Epic, and Eric Jones of the UTDWR. Amended memo will be delivered based upon conversation.		7/25/2017	7/25/2017
	Amended Memo	7/25/2017	Memo Amendments complete, submitted to Town Council 8/29/2017	Epic	8/28/2017	8/29/2017
	Town Council Action	8/29/2018	Awaiting Action by Town Council	TC	?	
16IKB002	Lot 115- Howard Residence					
	Building Permit		Approved and issued 6/29/2016	Epic		6/29/2016
	Stop Order		Issued stop order due to missing dumpster and porta-potty.	Epic		
	Stop Order Lifted		Issues resolved and work to resume.	Epic		
	Inspections		Initial Inspections Underslab Plumbing			8/8/2016 10/11/2016



Project / Task(s)	Description	Initiation Date	Status	Responsible Party	Projected Completion Date	Completion Date
	Update	11/6/17 11/21/17 01/28/18 4/13/2018	Framed, Windows installed. No electricity in house, waiting for Heber Power. Waiting on permission from neighbors to dig trench for powerline. Called for Update, no answer. Porta-potty concerns, will use Connor's porta-potty. Wrapping up exterior skin, then project will be on hold until spring when utilities can be dug and interior can be worked on Emergency inspection due to unclean site conditions. Site currently being cleaned up, workers were cleaning 4/29 and will clean 5/1. Epic to perform inspection 5/2.	Epic		
	Update	6/11/2018	Working on utilities and connections, coming up June 25 to continue project. Project should be fully staffed July 4 th on until the end of summer. Left VM	Builder		
16IKB003	Lot 102- Connor Residence			<u> </u>	<u> </u>	
	Building Permit	7/18/2016	Approved and issued	Epic		8/17/2016
	Building Permit Revoked	12/1/2016	Revoked due to structural changes and errors	Epic		
	Inspections	9/1/2016	Initial Inspections			9/1/2016
	Building Permit Reinstated		Lee Ewell, the new contractor from Ewell Enterprises picked up building permit,			6/13/2017



Project / Task(s)	Description	Initiation Date	Status	Responsible Party	Projected Completion Date	Completion Date
			construction to resume.			
	Inspections	6/23/2017	Temp power Out house completed 4-way		7/25/2017 10/1/2017	6/23/2017
	Update	1/28/18 03/05/18	HVAC is in, working on Plumbing, Electrical, Insulation, Drywall and 4-way. Needs water meter set. Working on Interior Details, then painting. Wrapping up painting, doors and cabinets are in. Getting ready to start plumbing. Final inspection scheduled for Friday July 6			
16IKB004	Lot 218- Frank Residence					
	Building Permit		Approved and issued	Epic		3/23/2016
	Inspections		Footing Underground Temp power			12/6/2016
	Update	9/15/17	Having problems with steel fabricators, contractor hopes to have steel in by end of month.	Builder	11/15/2017	
	Site Issues	9/18/17	Erosion and No Dumpster Issues Reported to Epic.	Epic/PC	9/18/2017	9/18/2017
	Site Issues	9/17/17	Contractor will get a dumpster to the property, Contractor reports there is no erosion, that it is due to roadbase.	Epic/PC	9/21/2017	9/27/2017



Project / Task(s)	Description	Initiation Date	Status	Responsible Party	Projected Completion Date	Completion Date
	Update	1/29/2018 3/5/2018 3/27/2018	Framing is completed, Windows and Doors ordered, experiencing delays with Questar Gas Install see 17IKB005. Prepping for a 4-way inspection by the end of the week. Had 4-way and insulation, waiting on home owners to select siding. Waiting on home owners to select siding. Contractor has removed sediment from the roadway. Instructed by Town Clerk to revegetation according to approved Grading plan.	Builder	3/1/2018	
		7/02/2018	Drywall almost finished, owner picking out siding.	Builder		
17IKB002	Lot 203- Simpkin's Landscapi	ng				
	Landscape Permit	6/16/2017	Epic sent memo regarding proposed approval on 6/16/2017 with understanding no work to be performed in ROW. Previous ROW work to be examined after attorneys look at it.	PC	6/16/2017	6/16/2017
	Town ROW	6/26/2017	Town attorney is trying to get to the bottom of the ROW issue and where to go with the ROW for this lot and all ROW in the Town.	Town Attorney		6/30/2017
	Planning Commission	6/26/2017	PC to measure from platted/surveyed centerpoint of "cul-de-sac" based upon measurements of retaining walls from the centerpoint determines next step.	PC	8/1/2017	8/7/2017



Project / Task(s)	Description	Initiation Date	Status	Responsible Party	Projected Completion Date	Completion Date			
	Recommendation to TC	8/7/2017	PC made recommendation to TC regarding project approval. TC to decide how to proceed.	TC	8/7/2017	8/7/2017			
	Building Permit	4/27/2018	Building Permit Issued	Epic					
	Update	7/02/2018	Construction has not started yet. Evaluating a few options.	Builder					
18IKB001	Sheldon Residence								
	Building Permit	4/20/2018	Building Permit Issued	Epic					
	Update	5/10/2018	Soil Excavation Issue-placed soil as fill on neighboring lot. Not approved or permitted.	Epic					
		7/02/2018	Project is progressing and passing inspections.						
18IKB002	Daines Residence				-				
	Building Permit Application	4/27/2018	Planning Commission comments and Epic Site review comments sent back to Daines. Structural review redlines to be sent 5/1	Epic/PC					
	Update	7/02/2018	Getting footing inspection 7/5/2018. Reminded of town rule req. Portapotty and Erosion Control	Epic					



Interlaken Town

SITE DISTURBANCE AGREEMENT

A. Permit Required. A Town of Interlaken Site Disturbance Permit is required before any person or entity may landscape, excavate, grub and clear, grade, or perform any type of construction activity that will disrupt or cause a change in the natural landscape or increase impervious surfaces upon any parcel of property located in the Town. No excavating shall be done further than is necessary to place the lot on grade or for building a dwelling and /or garage. Excavation or saw cutting requirements and specifications are provided in a separate document.

- B. Exemptions. The following activities are exempt from the permit requirements of this Chapter:
- 1. Actions by a public utility, the Town, or any other governmental entity to remove or alleviate an emergency condition, including the restoration of utility service or the reopening of a public thoroughfare to traffic;
- 2. Actions by any other person when the Town determines, and documents in writing, that the actions are necessary to remove or alleviate an emergency condition;
- 3. Construction activities disturbing less than 200 square feet of land and surface area;
- 4. Residential landscaping and gardening activities disturbing less 100 square feet of land surface area;
- 5. Town of Interlaken capital improvement projects, provided that site disturbance control measures are included in the bid specifications and plans for the special improvement project.

C. Special Considerations. When residential landscaping and gardening activities disturbs an excess of 100 square feet of land, the town council may consider a waiver of some of the conditions listed below as requirements of the Site Disturbance Agreement. The applicant must apply for a waiver to the town council, and the council will consider the request as part of their regular business at a regularly scheduled town council meeting.

Refer to Title 09 "Building and Construction," Chapter 9.05, of the Interlaken Town Municipal Code for more information about the site disturbance permit.

The applicant must agree to the following policies and conditions prior to Interlaken Town granting approval for their request to disturb the natural landscape or increase impervious surfaces upon any parcel of property located in the Town.

- 1. Epic Engineering is the Interlaken Town Engineer and will review all permit applications and make recommendations to the Town Council. No permits will be approved until the plan is reviewed and signed by Interlaken Town's authorized representatives.
- 2. A policy of liability insurance must be obtained by the applicant, naming Interlaken Town as coinsured, insuring against liability for property damage and personal injury in an amount not less than 1 million (1,000,000.00) which may result from road conditions created by the encroachment/cut. No road restoration permit shall be issued until the policy or a valid binder therefore has been delivered to the Interlaken Town Clerk.
- 3. The applicant will provide a site plan and engineering survey if grade of land being disturbed is over a 10% slope, must be submitted to the Interlaken Town Clerk. This is to ensure compliance with the Land Use and Building Ordinances of Interlaken Town.
- 4. The applicant agrees to conform to all Land Use and Building Ordinances of Interlaken Town and the requirements in this agreement.
- 5. The applicant agrees to complete a location request with Blue Stakes of Utah to identify existing underground utilities, including but not limited to, the Interlaken water system, that

- could be affected by work in the road right-of-way. Failure to do so could result in fines and repair costs.
- 6. The applicant will provide a suitable toilet on-site or will provide the workers access to the facilities in a home prior to the work beginning.
- 7. The applicant shall utilize appropriate traffic signs, markers, and procedures in all construction activities as defined on the approved traffic control plan and in the Federal "Manual of Uniform Traffic Control Devices".
- 8. A suitable closed trash container will be on site as soon as the building phase begins to produce trash. The applicant is responsible for any trash that leaves the property due to wind or to negligence by the workers. No construction debris is to be put in the community dumpster located at the Valais City Park off Interlaken Drive. Per the Interlaken Town Ordinances, a \$500.00 fine will be imposed on the Property Owner for any violations.
- 9. Unless appropriate traffic control measures are utilized, vehicles must be parked off the road. No work shall take place in the 33-foot road right-of-way from November 1st through April 1st that interferes with snow removal activities. No unattended vehicles or equipment or any obstacles shall be placed in the road right-of-way during these months. Vehicles or equipment left in the road right-of-way may be removed at the owner's expense, as specified in Interlaken Municipal Ordinance "Title 06 Town Streets," available on the town website: http://www.town-of-interlaken.com/. Neither the toilet nor the dumpster will be located in the road right-of-way.
- 10. The applicant shall take precautions to prevent damage to the pavement and shoulder surfaces at all times. Paved and shoulder surfaces outside the work area shall also be protected. The operation of steel tracked equipment or the placement of steel outriggers/stabilizers in direct contact with the pavement surface shall be prohibited. To avoid unnecessary damage to paved surfaces backhoes and track equipment should use rubber cleats or paving pads. Any damage to the paved or shoulder surfaces shall be repaired to the satisfaction of the Inspector at the applicant's expense.
- 11. A Road Damage deposit applies to all modifications of roadways and must be paid prior to our approval of the plans. Any deposit refund amounts will be determined by assessing road damage due to the construction effort once construction has completed and season permitting.
- 12. Environmental Control: a) Dust and debris will be controlled at all times. b) Noise will be kept down so as not to become a nuisance. c) Clean up will require the removal of all equipment, material, barricades and similar items from the right-of-way. Areas used for storage of excavated material will be smoothed and returned to their proper contour. The street will need to be vacuumed and/or swept in order to restore the surfaces and surrounding surfaces to their clean condition by the end of the workday. The applicant will be fined \$500.00 per occurrence for failure to keep the Interlaken Town Roads clear of debris.
- 13. New construction applications require a certified staked survey that is dated within 5 years of the application.
- 14. All road modification work will be completed by the completion date specified in this agreement. If the work is not completed satisfactorily by this date, the Town reserves the right to complete the work using it's own contract labor. The cost of this work will be deducted from the owner's road damage deposit along with a \$500 service fee.
- 15. Failure to Comply In the event of failure on the part of any person, firm, public utility, or corporation to comply fully with the provisions of Interlaken Town Ordinances, enforcement authorities of Interlaken Town are authorized to: a) Initiate action by citation and/or proceed to forfeit bonds; b) Under conditions which create an immediate hazard to public health or safety, to require the responsible entity to immediately repair or remove the hazard from the right-of-way and require the responsible entity to bear all costs of the repair or removal plus 15%, or c) Under conditions which do not create an immediate hazard to public health or safety give written notice to the responsible entity to repair or remove such hazard from the right-of-way. Such notice may be served either by personal service or by mailing the notice to the responsible entity by registered mail and posting by copy thereof on such hazard for a

period for 5 days. If such hazard is not removed within 5 days after the notice is complete, the Town may remove the same at the expense of the person, firm, or corporation and recover costs and expenses, and also liquidated damages in the amount of \$100 for each day the hazard remained within the right of way after notice was served and d) Immediately rescind any pre-qualification which may have previously been granted.

Please read and sign the agreement on the following page. See the **Interlaken Fee Schedule** for a list for fees and deposits for road right of way work. Submit it with a check made out to Interlaken Town for the Interlaken fees and deposits to:

Bart Smith, Interlaken Town Clerk (435) 565-3812 interlakenclerk@gmail.com
P.O. Box 1256
Midway, UT 84049

The undersigned responsible party agrees to the policies and conditions of the Interlaken Site Disturbance Agreement.

Excavaiton Contractor

I HEREBY certify that I have read and examined this application and knowing the same to be true and correct. All provisions of law and ordinances governing this type of work will be complied with whether specified herein or not. The granting of this permit does not presume to give authority to violate or cancel the provisions of any other State or Local Law regulating construction or performance of construction and that I make this statement under penalty of perjury.

Contractor Name:		
Signature:		
Mailing Address:		
Phone Contact:		
Email Address:		
Lot #	Interlaken Addre	ss:
Date:		
Description of Work:		
Receipt of Payment		
Name:		
Interlaken Title:		
Signature		for Interlaken Town having
Received check #	for the amount of \$	on
(date)		

Interlaken Town Fee Schedule Site Disturbance Agreement

Fee Description:	Amount:
Interlaken Permit Application Fee	\$150
Epic Engineering Inspection Fee	\$250
Road Impact Fee	\$2500
Road Damage Deposit (refundable)	\$2500
Completion Deposit (refundable)	\$1500
Total Amount	\$6900

Payable to Interlaken Town - due upon submission of this agreement.

Mail check to: Interlaken Town P.O. Box 1256 Midway, UT 84049

ZION Bank Fund Balances Over Time

Fund	FY	2016 Year End	FY	2017 Year End	FY	(2018 Year End (approx)
Bond Sinking	\$	157,394	\$	158,514	\$	158,684
Water Revenue	\$	26,471	\$	30,613	\$	37,333
Water System Reserves	\$	146,527	\$	171,750	\$	179,791
Transportation Reserves	\$	119,963	\$	128,584	\$	104,823
Building	\$	8,090	\$	19,854	\$	26,574
General	\$	29,559	\$	71,143	\$	54,763
TOTAL Accounts	\$	488,004	\$	580,458	\$	561,968

