This Hailey Transportation Master Plan appendix includes the following elements:

A Non-Motorized Design Guidelines; divided into (1) Pedestrian and (2) Bicycle sub-sections

B Street Design Guidelines (lane widths, local street options and stop-sign policy)

A - Non-Motorized Design Guidelines

Pedestrian System

Each day, nearly everyone in Hailey is a pedestrian for at least some part of every trip. Yet within the last 20-30 years pedestrian travel has sometimes received secondary attention. Historically, a much greater emphasis has been placed on the planning and design of streets, with the primary focus on mobility and access for the automobiles and trucks.

The City should consider more immediate refinements to its pedestrian design standards, to increase pedestrian accessibility and mobility needs and to comply with the Americans with Disabilities Act (ADA)[i].

There are many opportunities to improve pedestrian conditions and in doing so, making Hailey more walkable and livable. The purpose of the Non-Motorized Design Guide is to highlight significant local design features relative to the ADA requirements based on the premise that accessible design is the foundation for all good pedestrian system design.

The Non-Motorized Design Guide directly references a number of federal and professional sources for the full range of pedestrian elements rather than develop a fully independent and comprehensive guide, including: FHWA's ***Designing Sidewalks and Trails for Access,***[ii] AASHTO's ***Guide for Pedestrian Facilities,***[iii] and, FHWA's ***Pedestrian Facility User's Guide.***[iv] Detailed sidewalk, curb ramp, driveway crossing and trail design elements are provided in *Designing Sidewalks and Trails for Access.* The Non-Motorized Design Guide summarizes only those elements of the pedestrian system crucial to current planning, design and construction of critical pedestrian facilities in Hailey.

Bicycle System

Similar design guidance is important for the consistent development of a system of bicycle lanes and share-lane facilities. Significant guidance is provided at the federal and state level in assisting the City in revisions for design guides to bicycle facilities, including: AASHTO's ***Guide for the Development of Bicycle Facilities***[v] and the ***MUTCD.***[vi]

1. Pedestrian Design Guide

As part of the NMTP effort an examination of the City's current street, sidewalk and curb ramp design standards was conducted, including a comparison of the City's standards to the Americans with Disabilities Act Accessible Guidelines (ADAAG)[vii]. The City has adopted street standards and is administering these standards throughout the city as

part of new street development. The City has design standards for sidewalks, driveway crossings and curb ramps. While these standards are intended to provide mobility enhancements for pedestrians, some of them have ADA-related issues.

The Non-Motorized Design Guide focuses on pedestrian issues with separate sections for Sidewalk Corridors, Grade and Cross Slope, Driveway Crossings, Curb Ramps, Pedestrian Crossings and Other Design Features. For each element of the pedestrian portion of the Design Guide a summary is provided, including:

- Americans with Disabilities Act Accessible Guidelines (ADAAG) regulations
- FHWA Designing Sidewalks and Trails for Access – Best Practices Design Guide (where applicable)
- ADAAG Draft Rule[viii] (regulations that may be added or amended in the near future)

Sidewalk Corridor

The city should consider re-working its street and sidewalk standards to include definitions of the sidewalk corridor. The *Sidewalk Corridor* is defined as that portion of the pedestrian system from the edge of the roadway (back of curb) to the edge of the right-of-way, generally along the sides of streets, between street corners. For the purpose of the Hailey Non-Motorized Design Guide, the width of the sidewalk corridor extends to the edge of the street or roadway, even if part of that area is not paved. Sidewalk corridors that promote access include the following characteristics:

- Wide pathways;
- Clearly defined pedestrian, furniture, and frontage zones;
- Minimal obstacles/protruding objects;
- Minimal walking distance;
- Moderate grades and cross slopes;
- Rest areas outside of pedestrian zone;
- Firm, stable, slip resistant surfaces; and
- Good lighting

The city is also not the sole public agency responsible for the development and maintenance of these sidewalk corridor characteristics. The Idaho Transportation Department shares in some jurisdictional responsibilities. Highlighted elements of the sidewalk corridor included

in the Non-Motorized Design Guide are sidewalk widths, grades and slopes. The city can directly reference Designing Sidewalks and Trails for Access as a design guide for other sidewalk corridor elements.

The Sidewalk Corridor Zone System

This section defines the sidewalk zone system which includes the design of sidewalks and the buffers between sidewalks, moving traffic and on-street vehicle parking. The definitions of the sidewalk corridor elements are taken directly from *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*[ix]. The sidewalk corridor consists of the following four distinct functional zones:

Edge Zone—area between the face of curb and the furnishing zone, an area of required clearance between parked vehicles or traveled way and appurtenances or landscaping.

Furnishings Zone—area of the sidewalk corridor that provides a buffer between pedestrians and vehicles, which contains landscaping, public street furniture, transit stops, public signage, utilities, etc.

Throughway Zone—walking zone that must remain clear, both horizontally and vertically, for the movement of pedestrians (Note: ADA requires a minimum of 48 inches of clear width.)

Frontage Zone—distance between the throughway and the building front or private property line that is used to buffer pedestrians from window shoppers, appurtenances and doorways. It contains private street furniture, private signage, merchandise displays, etc. and can also be used for street cafes. AASHTO[x] refers to this as the "shy" zone.

The zone system is used to determine the width of the sidewalk corridor and help ensure that obstacles, such as utility poles and other street furniture, will not limit pedestrian access and mobility. **Figure E-1** illustrates the four zones using the example of a sidewalk corridor in a commercial area. The remaining portion of this section provides design guidance for each of these zones with the width varying in relation to

street type and *function*, and the *context zone* with specific *land use characteristics*.

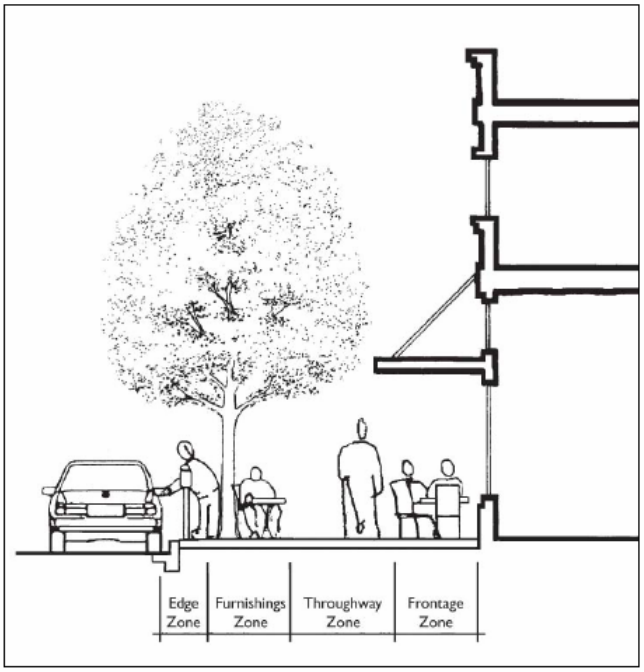


Figure E-1: The Sidewalk Corridor System (Graphic Source: ITE)

Possible City Design Standard Refinement

The width of the sidewalk corridor is one of the most significant factors in determining the type of pedestrian experience that the sidewalk provides. Additional space is often needed to accommodate items such as pedestrian crossings, on-street parking, street cafes, and high pedestrian volumes. **Table E-1** contains suggestions for the minimum widths of each sidewalk corridor zone, by city street functional classification and the three major land use contexts (each separated for commercial and residential types).

To better guide development, modifications to the city's current standards to include frontage and pedestrian zone dimensions will provide needed buffering and maneuverability space for pedestrians along busy arterial or industrial streets, but will require greater rights-of-way. The city has several options to achieve a wider pedestrian corridor through administration of revised standards:

- Acquire additional rights-of-way
- Placing a portion of the pedestrian corridor on private lands (possibly through easements)

- Reducing street widths (possibly by reducing the number of lanes or reducing lane widths).

Table E-1: Redefining the Sidewalk Corridor

Recommended Dimensions (feet)

Street Class	Sidewalk Corridor Zone	Land Use Context Zone: Downtown/ Core		Commercial		Residential	
Arterial	Curb	1.5	2.5 ft at diagonal parking trees in wells	1.5	2.5 ft at diagonal parking trees in wells	0.5	landscape strip w/ trees [a]
	Furnishing	7		7		6	
	Pedestrian	10		8		6	
	Frontage	3		2.5		1.5	
	Total Width	21.5		19		14	
Collector	Curb			0.5	landscape strip w/ trees [a]		
	Furnishing			8			
	Pedestrian			8			
	Frontage			2.5			
	Total Width			19			
Residential Collector	Curb					0.5	landscape strip w/ trees
	Furnishing					4	
	Pedestrian					6	
	Frontage					1.5	
	Total Width					12	
Local Street	Curb	1.5	2.5 ft at diagonal parking trees in wells [b]	1.5	2.5 ft at diagonal parking trees in wells [b]	0.5	landscape strip w/ trees
	Furnishing	5		5		4	
	Pedestrian	6		6		5	
	Frontage	2.5		2.5		1.5	
	Total Width	15		15		11	

Notes:

[a] 4 ft minimum

[b] Not required on service-oriented streets, 5 ft when required

Sidewalk Clear Width (ADA)

The ADA is also specific to the effective clear width of sidewalks. A minimum of 3 feet of clear width has been the operating rule. However, as shown in **Table E-2**, revised ADA policies are tending towards four feet of clear width along pedestrian access routes. The City's street and sidewalk standards can be modified with mandatory clear zone widths to help ensure that obstacles are not constructed within the pedestrian zone.

Table E-2. Sidewalk Width Regulations

ADAAG Regulations:

Clearances (Section 403.5) - *Clear Width* of walking surfaces shall be a minimum of 3 feet (36 inches), except as provided at turns and passing spaces.

Passing spaces - "An accessible route with a clear width less than 5 feet shall provide passing spaces at intervals of 200 feet maximum. Passing spaces shall be either: (a) a space 5 feet minimum by 5 feet minimum; or, (b) an intersection of two walking surfaces providing a t-shaped space where the base and arms of the t-shaped space extend **4 feet** minimum beyond the intersection.

FHWA Designing Sidewalks and Trails for Access:

Width - The pedestrian "zone" (sidewalk) should be at least 5 feet wide for two pedestrians to travel side by side without passing other pedestrians, or for two people going in opposite directions to pass one another.

The pedestrian zone should never be less than 3 feet. This minimum width is only acceptable when: (1) A wider width is impossible; (2) The narrow width continues for as short a distance as possible; and, (3) Passing spaces are provided at intervals of no more than 200 feet.

ADAAG Draft Rule:

Clear Width - The minimum clear width of a pedestrian access route shall be **4 feet**, exclusive of the width of the curb.

Refinement to Hailey Standard:

Current standards should be modified to stipulate that a minimum clear width of **4 feet is required.**

Sidewalk Grade and Cross Slopes

Grades and cross slopes are very difficult for some people with mobility impairments to negotiate because it is harder to travel across sloped surfaces than horizontal surfaces. People with mobility impairments who are ambulatory or use manual wheelchairs (see **Figure E-2**) must exert significantly more energy than other pedestrians to traverse sloped surfaces. Powered wheelchairs are affected by the additional work required on steep grades because more battery power is used. This reduces the travel range of a powered chair. Both powered and manual wheelchairs can become unstable and/or difficult to control on sloped surfaces. Whenever possible, slopes should not be artificially created and should be minimized (to the extent possible) to improve access for people with mobility impairments. See **Table E-3**.

Figure E-2: Sidewalk Grade Impact

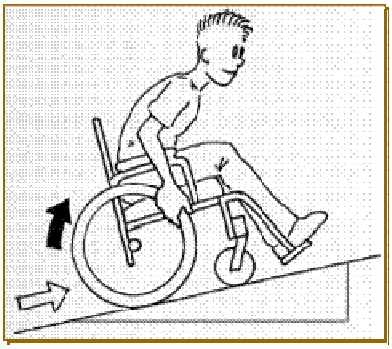


Table E-3. Sidewalk Grade Regulations

ADAAG Regulations:

Slope - The running slope of walking surfaces shall not be steeper than 1:20 (5%). The cross slope of walking surfaces shall not be steeper than 1:48 (roughly 2%).

ADAAG Draft Rule:

Cross Slope - The cross slope of the pedestrian access route shall be 1:48 maximum.

Grade - The grade of the pedestrian access route within a sidewalk shall not exceed the grade established for the adjacent roadway. (EXCEPTION: The running slope of a pedestrian access route shall be permitted to be steeper than the grade of the adjacent roadway, provided that the pedestrian access route is less than 1:20)

Refinement to Hailey Standard:

Current standards should be modified to specify consistent grade and cross slope as noted in ADAAG.

Driveway Crossings

Driveway crossings permit cars to cross the sidewalk and enter the street. They serve the same basic purpose for cars as curb ramps serve for pedestrians. Therefore, they consist of many of the same components found in curb ramps. It is the driver's responsibility to yield to the pedestrian at the driveway-sidewalk interface. Unfortunately, this does not always happen, and pedestrians are put at risk. Minimizing the number of driveway crossings in a sidewalk significantly improves pedestrian safety.

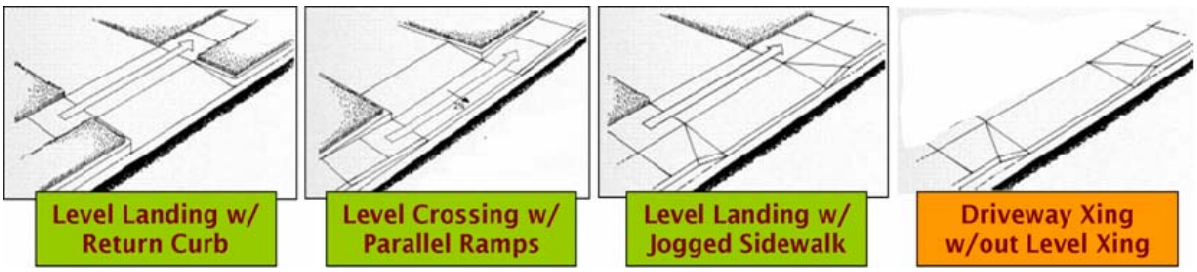
Driveway crossings should be designed so that both the pedestrians and the drivers are able to use them effectively. However, a driveway crossing must provide a way for cars to negotiate the elevation change between the street and sidewalk. This is generally achieved by ramping all or a portion of the driveway crossing. When the ramp for the motorist crosses the pedestrian's path of travel, significant cross slopes and changes in cross slope must be negotiated by the pedestrian.

Change in Cross Slope

A change in cross slope is an abrupt difference between the cross slope of two adjacent surfaces. ADAAG does not permit cross slope to exceed 2 percent (changes in cross slope are allowed between 0-2 percent only). Changes in cross slope are commonly found at driveway crossings without level crossings. When considering the needs of pedestrians, change in cross slope is evaluated over a 2-foot interval, which represents the approximate length of a single walking pace and the base of support of assistive devices, such as wheelchairs or walkers. The design recommendations for change of cross slope specify the relationship between two adjacent surfaces, not the actual cross slope of either surface.

Figure E-3 illustrates a number of driveway crossings, depicting those with and without level sidewalk landings, for use by the City in revising its standards, to include level pedestrian surfaces with the required minimum cross-slope.

Figure E-3. Driveway Crossing Types



Curb Ramps

For pedestrians of all types, the curb ramp is the immediate junction between the sidewalk and street crosswalk. It is no surprise, then, that a great deal of attention is paid to the planning and design of curb ramps. In general, curb ramps are most commonly found at intersections, but

they may also be located at bus stops and mid-block (street) crossings. The implementing regulations under Title II of the ADA specifically identify curb ramps as requirements for existing facilities, as well as all new construction.

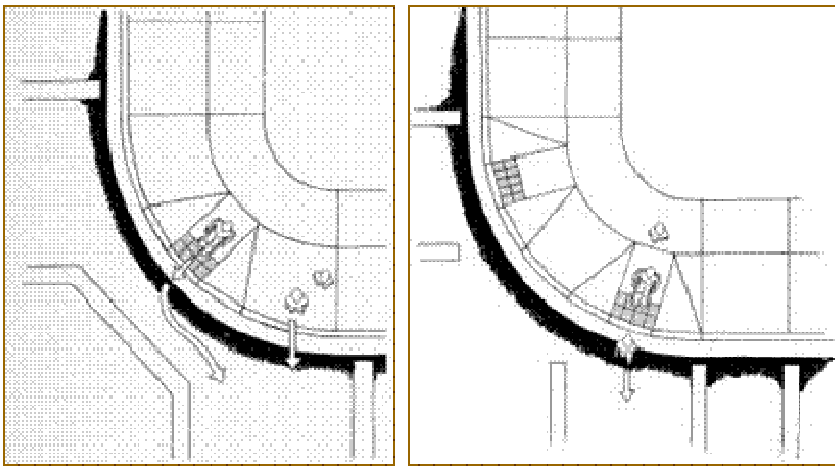
Curb ramp design issues vary from city to city and from subdivision to subdivision. This section provides some background information on curb ramps, user needs, and what can be done to meet ADA conformity by revisions to current curb ramp designs.

Mobility-Impaired Users

As noted by FHWA, curb ramps are designed to provide access to people who use wheeled forms of mobility. Without curb ramps, people who use wheelchairs would not be able to independently access the sidewalk and street.

Not all wheelchairs are similar in design and function, nor are all mobility-impaired pedestrians equally mobile. In fact, not all mobility-impaired pedestrians require a curb ramp. So, "a one-size fits all" curb ramp design is difficult to develop, as illustrated in **Figure E-4.**

Figure E-4. Types of Curb Ramp Designs



Vision-Impaired Users

For vision-impaired pedestrians, the curb is the most reliable cue to identify the transition between the sidewalk and the street. Most, if not all, curb ramps remove this cue. The physical ramp itself becomes more of a barrier to some vision-impaired walkers. Curb ramps are more difficult to detect by the range of vision-impaired. The combination of curb ramps and placement of truncated domes can, if done improperly,

cause greater confusion to vision-impaired pedestrians seeking direction to cross busy streets.

Ideal Design Characteristics

FHWA's *Designing Sidewalks and Trails for Access* identifies a number of curb ramp designs that make the best accessible connection between the sidewalk and the street – for the full range of pedestrian users. To maximize accessibility and safety for all pedestrians, particularly when retrofitting existing curb ramps, curb ramp designs should attempt to meet all of the best practices for curb ramp design shown in **Table E-4.** Depending on site constraints, it may not be possible to incorporate all of the best practices within each curb ramp.

Table E-4. Curb Ramp Design Best Practices

Best Practice	Rationale
Provide a level maneuvering area or landing at the top of the curb ramp	Landings are critical to allow wheelchair users space to maneuver on or off of the ramp. Furthermore, people who are continuing along the sidewalk will not have to negotiate a surface with a changing grade or cross slope.
Clearly identify the boundary between the bottom of the curb ramp and the street with a detectable warning.	Without a detectable warning, people with vision impairments may not be able to identify the boundary between the sidewalk and the street.
Design ramp grades that are perpendicular to the curb.	Assistive devices for mobility are unstable if one side of the device is lower than the other or if the full base of support (e.g., all four wheels on a wheelchair) is not in contact with the surface. This commonly occurs when the bottom of a curb ramp is not perpendicular to the curb.
Place the curb ramp within the marked crosswalk area.	Pedestrians outside of the marked crosswalk are less likely to be seen by drivers because they are not in an expected location.
Avoid changes of grade that exceed 11 percent over a 610 mm (24 in) interval.	Severe or sudden grade changes may not provide sufficient clearance for the frame of the wheelchair causing the user to tip forward or backward.
Design the ramp that doesn't require turning or maneuvering on the ramp surface.	Maneuvering on a steep grade can be very hazardous for people with mobility impairments.
Provide a curb ramp grade that can be easily distinguished from surrounding terrain; otherwise, use detectable warnings.	Gradual slopes make it difficult for people with vision impairments to detect the presence of a curb ramp.
Design the ramp with a grade of 7.1 ± 1.2 percent. [Do not exceed 8.33 percent (1:12).]	Shallow grades are difficult for people with vision impairments to detect but steep grades are difficult for those using assistive devices for mobility.
Design the ramp and gutter with a cross slope of 2.0 percent.	Ramps should have minimal cross slope so users do not have to negotiate a steep grade and cross slope simultaneously.
Provide adequate drainage to prevent the accumulation of water or debris on or at the bottom of the ramp.	Water, ice, or debris accumulation will decrease the slip resistance of the curb ramp surface.
Transitions from ramps to gutter and streets should be flush and free of level changes.	Maneuvering over any vertical rise such as lips and defects can cause wheelchair users to propel forward when wheels hit this barrier.
Align the curb ramp with the crosswalk, so there is a straight path of travel from the top of the ramp to the center of the roadway to the curb ramp on the other side.	Where curb ramps can be ahead, people using wheelchairs often build up momentum in the crosswalk in order to get up the curb ramp grade (i.e., they "take a run at it"). This alignment may be useful for people with vision impairments.
Provide clearly defined and easily identified edges or transitions on both sides of the ramp to contrast with sidewalk.	Clearly defined edges assist users with vision impairments to identify the presence of the ramp when it is approached from the side.

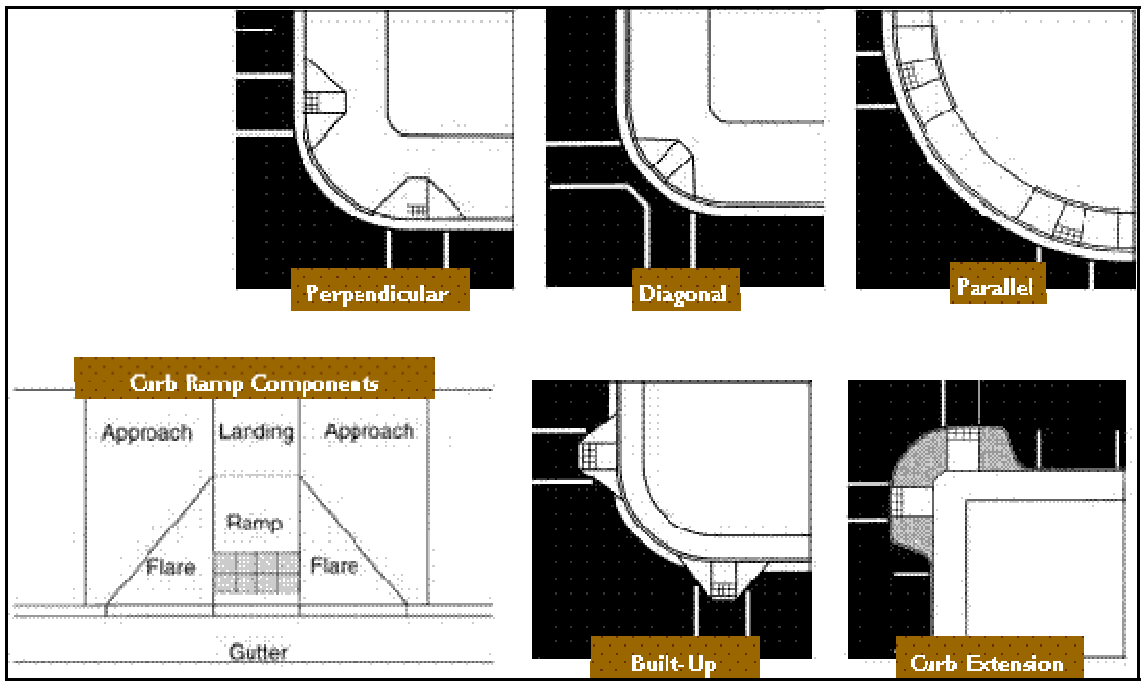
Curb Ramp Types

Curb ramps are usually categorized by their structural design and how it is positioned relative to the sidewalk or street. The structure of a curb ramp is determined by how the components, such as ramps and flares, are assembled. The type of curb ramp and the installation site will

determine its accessibility and safety for pedestrians with and without disabilities. As shown in **Figure E-5**, the following types of curb ramps are most typical:

- Perpendicular curb ramps
- Diagonal curb ramps
- Parallel curb ramps
- Combination curb ramps
- Built-up curb ramps
- Curb extension

Figure E-5. Curb Ramp Types and Components



ADAAG has specifically addressed minimum standards for curb ramp components. In some cases FHWA has provided greater detail on recommended curb ramp designs, as summarized in Table E-5**.** Where there are differences between ADAAG and FHWA's *Designing Sidewalks and Trails for Access,* it is recommended that Hailey follow the FHWA guidelines for ADA compliance.

For each of the various curb ramp types the City should consider revising its curb ramp standards consistent with FHWA's *Designing Sidewalks and Trails for Access* to address each of the following components:

Curb Ramp Grade – ADAAG permits curb ramp slopes of 8.33% for new construction. FHWA recommends 7.1% to allow for construction

tolerances. For retrofits where 8.3% ramp slopes cannot be attained, FHWA specifies the following ADAAG (1991) exceptions (not to be used for new construction):

- A slope between 8.33% and 10% is permitted for a maximum rise of 6 inches.
- A slope between 10% and 12.5% is permitted for a maximum rise of 3 inches.
- A slope steeper than 12.5% should be avoided regardless of length of ramp.

Ramp Cross Slope – Ramp cross slopes should not exceed 2.0%.

Ramp Length – See FHWA Designing Sidewalks and Trails for Access.

Ramp Width – Recommended width is 4 feet (48 inches), but will never be less than 3 feet (36 inches).

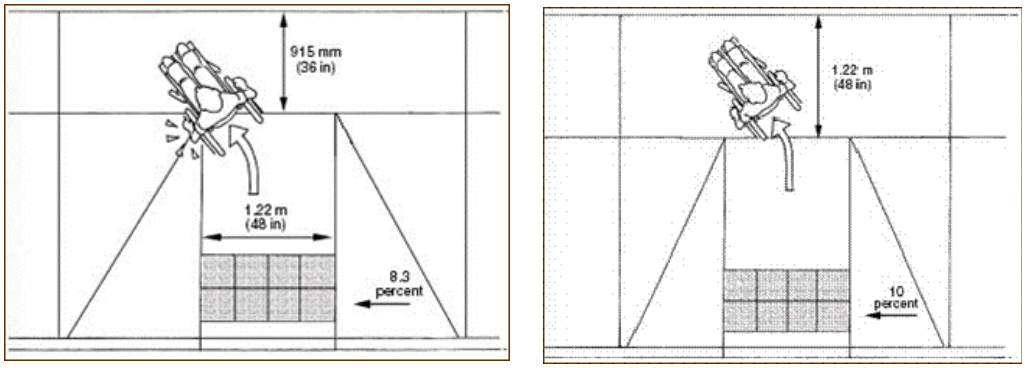
Gutter Slope – Drainage slopes should not exceed 2%. On most curb ramps, to avoid rapidly changing grades, the cross slope of the street and gutter approach should not exceed 5%.

Change of Grade – Transition areas should have a minimum grade change (less than 11%) for a gradual transition for wheelchair users.

Sidewalk Approach Width – Sidewalk approaches should have a minimum, 3-foot (36-inch) clear space, free of obstacles.

Landing Dimension and Slope – Slopes of a landing should not exceed 2%. As shown in **Figure E-6**, landings should extend at least 4 feet (48 inches) beyond the top of the curb ramp for maneuverability. If the space is limited and a 4-foot landing cannot be provided, an absolute minimum, 3-foot (36-inch) landing is acceptable, coupled with a minimum ramp width of 4 feet (48 inches) and ramp flare slopes not to exceed 8.3%.

Figure E-6. Curb Ramp Landings Are Critical



The relationship between curb ramps and street design is discussed further in the following section — *Pedestrian Crossings*.

Pedestrian Crossings

In *Designing Sidewalks and Trials for Access,* FHWA fully defines pedestrian crossings as *any location where the pedestrian leaves the sidewalk and enters the roadway*. At a pedestrian crossing, the pedestrian's path of travel crosses the motorist's path of travel. Pedestrian crossings include (a) mid-block crossings and (b) street intersections. At mid-block crossings, pedestrians generally encounter traffic moving in two directions. At street intersections, particularly those controlled with traffic signals, traffic is usually moving in multiple directions because of turning vehicles.

A considerable portion of *Designing Sidewalks and Trials for Access* is summarized here regarding pedestrian crossings at street intersections, because it gets at the crux of an emerging issue: *how to design arterial street intersections to balance the needs of drivers and pedestrians*.

Possible Design Solutions at Wide Intersections

The City can apply a number of techniques to improve pedestrian conditions and access at wide intersections (particularly SH-75) where appropriate right-of-way exists, including:

- Install center medians to provide a refuge for slower pedestrians;
- Install accessible pedestrian signals to assist in providing people with vision impairments enough time to cross the street;
- Increase crossing times so that people who walk slowly will have sufficient time to cross before the signal indication changes;
- Increase the crossing times so that people who delay the start of their crossing to confirm the WALK interval will have sufficient time to cross before the signal indication changes;
- Restrict right turns on red;
- Enhance the visibility of the crosswalk markings or consider a raised crosswalk with detectable warnings (truncated domes) at both ends;
- Reduce crossing distances and increase visibility through the construction of curb extensions;
- Reduce traffic speed;
- Clarify the pedestrian crossing area by installing stamped or raised crosswalks with detectable warnings (truncated domes) installed at both ends;
- Provide pedestrian lead time and an accessible pedestrian signal so

pedestrians, including those with vision impairments, can assert themselves in the crosswalk before motorists start making right and left turns;

- Provide mid-block signalized crossing with accessible pedestrian signal opportunities at busy intersections to encourage people to cross where there are fewer potential points of conflict between pedestrians and motorists;
- Provide a curb extension to decrease crossing distances and increase pedestrian visibility; and
- Add traffic and pedestrian signal indications if they do not already exist.

Turning Radius

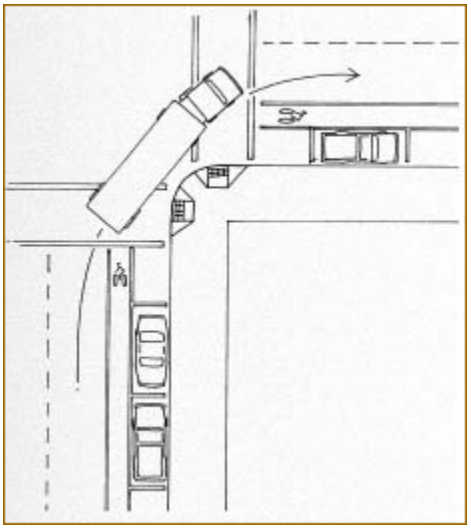
Designing intersections with smaller turning radii slows traffic speeds and allows perpendicular curb ramps to be positioned parallel to the crosswalk path of travel, as well as perpendicular to the curb. In addition, smaller turning radii significantly decrease crossing distances for pedestrians. Smaller radii also enhance detection of the crosswalk and improve crossing conditions for people with vision impairments because there is a greater distinction between the perpendicular and parallel traffic flows.

Appropriate driver sight lines at street intersections are important for pedestrian safety. Street design and surrounding land use patterns vary significantly within the City and can greatly affect the prevailing sight lines.

Intersection Design Issues for Further Consideration

The design speed of arterial streets greatly affects the design requirements of intersection corner radii. SH-75 was originally constructed with greater design orientation to auto and truck mobility. These designs also affect the type of sidewalk approaches and curb ramps to accommodate intersecting pedestrians. As illustrated in **Figure E-7**, by reducing the intersection corner radii at some future intersections (arterial design speed), the City may better coordinate with ITD and accommodate pedestrians of all types by including sidewalk buffers and approaches at corners, and perpendicular curb ramps or parallel curb ramps) rather than diagonal curb ramps. Further, the addition of on-street bicycle lanes adds turning space for larger vehicles in lieu of wider curb radii.

Figure E-7. Design Speed and Corner Radii Affect Pedestrian Features



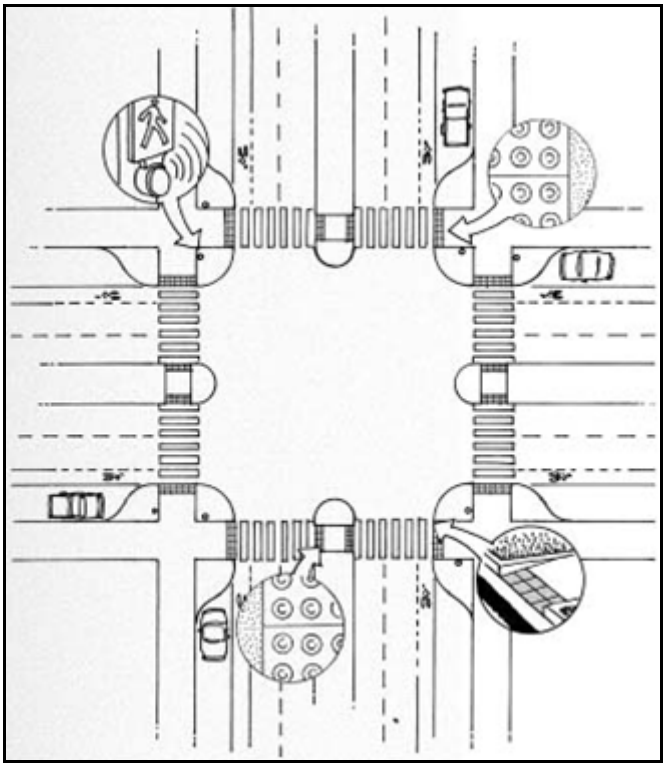
Other Design Features

The City should continue to conduct further examination into the application of other design features that assist pedestrians. Some of these design features include truncated domes as detectable warnings and audible signals to assist blind walkers (if a local issue) at major, signalized street intersections—particularly those with complex crossings and configuration.

Detectable Warnings – Truncated Domes

Detectable warnings are an ADA requirement in the current ADAAG for use by the vision-impaired to detect the boundary between the sidewalk and the street. Examples of detectable warnings are illustrated in **Figure E-8**. The original requirement in ADAAG was suspended for a time to conduct further research. Research was conducted and the suspension of the requirement was lifted on July 26, 2001. At the time FHWA's *Designing Sidewalks and Trails for Access* went to print, the suspension had not been lifted, so its text did not mention that detectable warnings are required.

Figure E-8. Example of Detectable Warnings



Detectable warnings are now required when constructing and altering curb ramps. Truncated domes are the only detectable warnings allowed by ADAAG.

2. Bicycle Design Guide

The following section provides a summary of design guidance and recommendations regarding bicycle system facilities in Hailey.

Revising the Bicycle Planning Language

The City of Hailey can begin more proactive planning for bicycle facilities by first expanding upon and clarifying the definitions of the various bicycle facilities, especially for the on-street bicycle system. Historical plan documentation in Hailey has concluded in text and mapping a "Bikeway" or "Bikeway Route" network, some of which is may be implied to mean on-street bicycle lanes. What are bikeway routes? Are they separate lanes for cyclists or a series of signs and painted symbols that indicate for both motorists and cyclists the need to share the outside

travel lane? There is need for further clarity in these definitions, otherwise planners, engineers, policy officials and the general public might be unclear what the TSP full intentions are. Figure E-9 illustrates the basic forms of bikeway facilities as defined by AASHTO.[xi] Pavement markings and signing guidance is provided by the Manual of Uniform Traffic Control Devices (MUTCD)[xii]. Consistent with the MUTCD, the City of Hailey should adhere to the following definition of terms concerning bicycle facilities:

Bicycle Facilities

This is a general term denoting improvements and provisions that accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.

Bikeway

Bikeway is a generic term for any road, street, path that in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive bicycle use or are to be shared with other travel modes.

Bicycle Lane

A bicycle lane is a portion of a roadway that has been designated by signs and pavement markings for preferential or exclusive use by bicyclists. Bicycle lanes are facilities that are placed on both sides of a street, and they carry bicyclists in the same direction as adjacent vehicle traffic. In addition to lane striping, pavement and signage identify lanes.

Another type of bicycle lane is a bikeway. Shoulders are paved are at least four feet in and are separated from travel lanes with a lane stripe. This facility is typically applied to a rural cross-section that does not have curb and gutter.

Designated Bicycle Routes

Designated bicycle routes consist of a system of bikeways designated by the roadway's jurisdictional authority with appropriate directional and informational route signs, with or without specific bicycle route numbers. Bicycle routes, which might be a combination of various types of bikeways, should establish a continuous routing. Designated bicycle routes can be divided into ***shared roadway*** and ***shared-use***

path facilities.

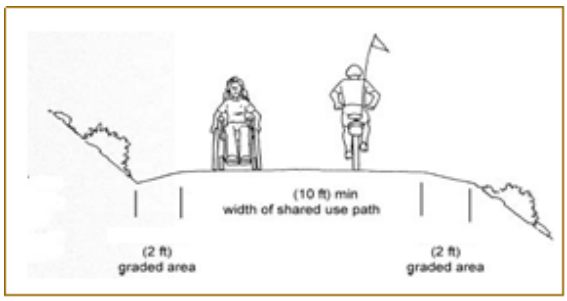
Shared Roadway

On a shared roadway, bicyclists and motorists use the same travel lane. Shared roadways bicycle routes can be placed on streets with wide outside travel lanes, along streets with bicycle route signing, or along local streets where motorists have to weave into the lane in order to safely pass a bicyclist.

Shared-Use Path

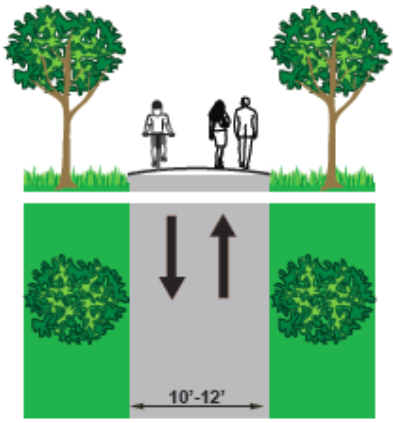
A shared-use path is a bikeway outside the traveled way and physically separated from motorized vehicular traffic by an open space or barrier, and is either within the highway right-of-way or within an independent alignment. Shared-use paths are also used by pedestrians (including skaters, users of manual and motorized wheelchairs, and joggers) and other authorized motorized and non-motorized users. Shared-use paths primarily attract recreational users, because they typically wind through and connect destinations; they also are an excellent opportunity to function as motorized transportation routes. Shared-use paths may be the preferred facility for any cyclist uncomfortable with the roads with vehicles.

Implementation of these specific terms will help advance consistent dialogue between the City of Hailey and the community regarding bicycle facility planning and design, within the context of multi-modal systems development.

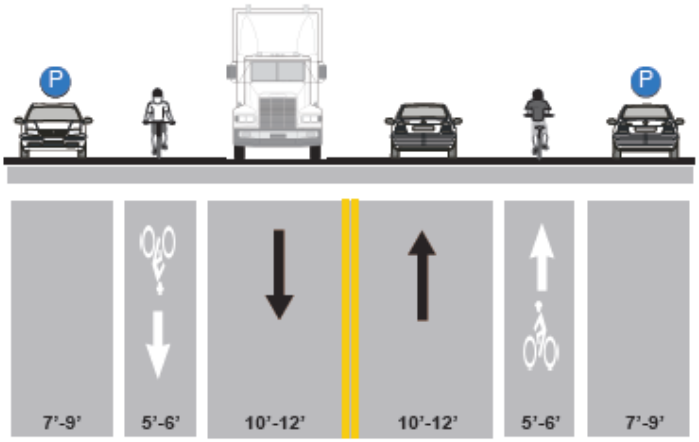


Shared-use paths should be constructed to minimum widths of 10 feet (Source: *FWHA Designing Trails and Sidewalks for Access)*

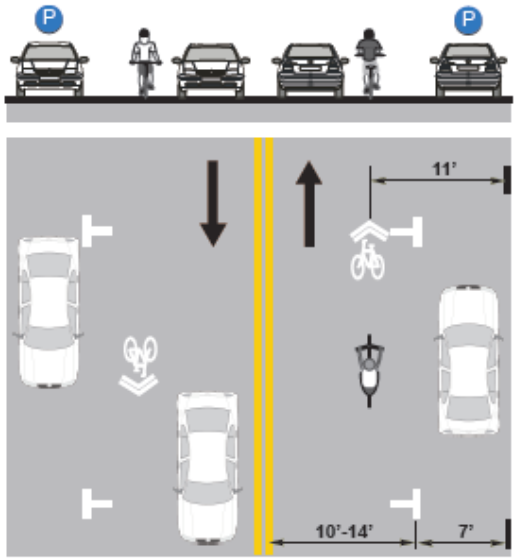
Figure E-9. Bikeway Facility Definitions



Shared Use Path



Bike Lane (Adjacent to Parking)



Signed Shared Lane

Defining Bicycle Users

There are a variety of bicyclists traveling within the study area, depending on their skills, confidence and preferences. According to AASHTO,

> *"some riders are confident riding anywhere they are legally allowed to operate and can negotiate busy and high speed roads that have few, if any, special accommodations for bicyclists. Most adult riders are less confident and prefer to use roadways with a more comfortable amount of operating space, perhaps with designated space for bicyclists, or shared use paths that are away from motor vehicle traffic. Children may be confident riders and have excellent bike handling skills, but have yet to develop the traffic sense and experience of an everyday adult rider."*

Source: www.canada.com/ottawacitizen/news

For the purpose of this study the following categories of bicycle user types are applied as the impact of different bicycle facility types are determined:

Advanced or experienced riders are generally using their bicycles as they would a motor vehicle. They are riding for convenience and speed and want direct access to destinations with a minimum of detour or delay. They are typically comfortable riding with motor vehicle traffic; however, they need sufficient operating space on the traveled way or shoulder to eliminate the need for either themselves or a passing motor vehicle to shift position.

Source: www.contextsensitivesolutions.org

Source: www.indygreenways.org

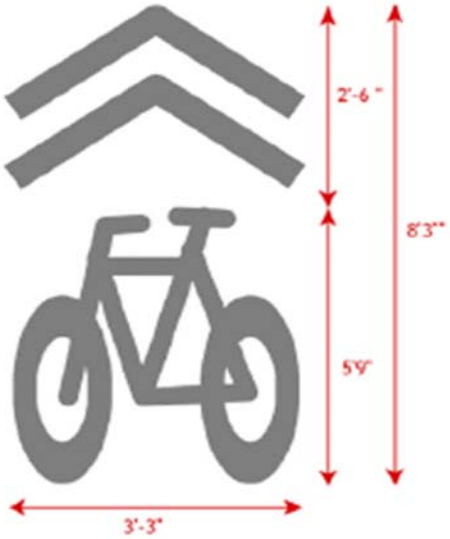
Basic or less confident adult riders may also be using their bicycles for transportation purposes, e.g., to get to the store or to visit friends, but prefer to avoid roads with fast and busy motor vehicle traffic unless there is ample roadway width to allow easy overtaking by faster motor vehicles. Thus, basic riders are comfortable riding on neighborhood streets and shared use paths and prefer designated facilities such as bike lanes or wide shoulder lanes on busier streets.

Children, riding on their own or with their parents, may not travel as fast as their adult counterparts but still require access to key destinations in their community, such as schools, convenience stores and recreational facilities. Residential streets with low motor vehicle speeds, linked with shared use paths and busier streets with well-defined pavement markings between bicycles and motor vehicles can accommodate children without encouraging them to ride in the travel lane of major arterials.

Shared-Lane Symbols and Markings

In the absence of sufficient space to include on-street bicycle lanes on several major streets, it is important to provide greater route designation for shared travel lanes. These shared lanes, if posted and marked appropriately, indicate significant bicycle traffic to both the motorists and cyclists. The use of "sharrow" pavement markings has been adopted by the state of California for these conditions. Example "sharrow" pavement markings are illustrated in **Figure E-10**. ITD has not yet considered and approved use of "sharrow" pavement markings for shared-lane designation.

Figure E-10. "Sharrow" Shared-Lane Symbol and Pavement Marking



Source: San Francisco's Shared-Lane Pavement Marking Study, Februrary 2004.

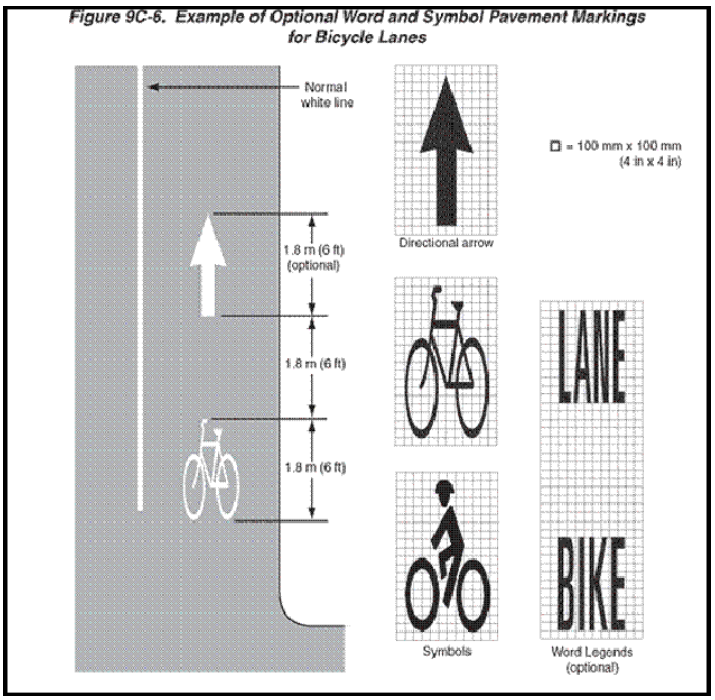
Further statewide policy consideration may be required before application and appropriate designation of sharrow pavement markings within the City. The City should exercise caution in "sharrow" pavement marking placement, particularly along streets with on-street parking. See San Francisco's research and findings in report titled "San Francisco's Shared-Lane Pavement Marking Study[xiii]."

Bike Lane Symbols and Markings

The City should be consistent with the MUTCD when striping bicycle lanes on its arterial and collector streets. **Figure E-11** summarizes the recommendations of the MUTCD.

Further statewide policy consideration may be required before application and appropriate designation of sharrow pavement markings within the City. The City should exercise caution in "sharrow" pavement marking placement, particularly along streets with on-street parking. See San Francisco's research and findings in report titled "San Francisco's Shared-Lane Pavement Marking Study[xiv]."

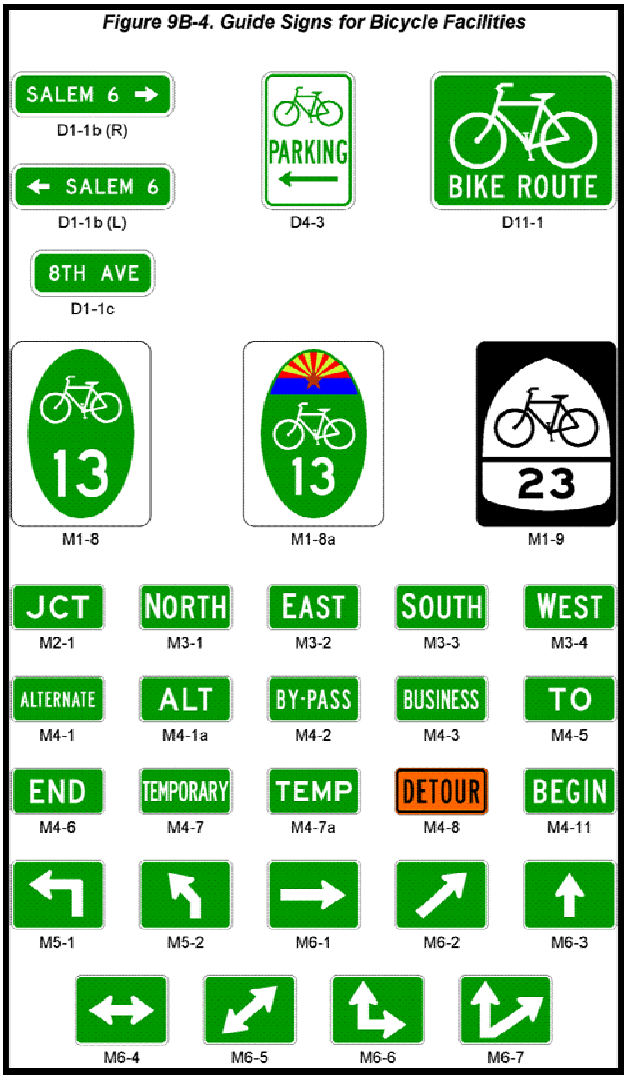
Figure E-11. MUTCD Standard Bike Lane Symbols



Bicycle Route Signing

Auxiliary signs may be used with standard bicycle route signs to inform cyclists of route continuity and major cycling attractions. Revised research by MUTCD sub-committee work has recently been completed and the MUTCD will be updated to include findings. Meanwhile, examples are shown in **Figure E-12**.

Figure E-12. Example of Auxiliary Bike Signs



The City should consider implementation of a city-wide bike route signing program that better links the on-street facilities and the shared-use paths. Once the MUTCD is revised, the City should consider the following for use in the installation of *junction*, *cardinal direction* and *alternative route auxiliary* signs (in conjunction with appropriate Bicycle Route Guide signs, Bicycle Route signs, or US Bicycle Route signs):

- Advance Turn Arrow (M5 series) and Directional Arrow (M6 series) auxiliary signs should be mounted below the appropriate Bicycle Route Guide signs, Bicycle Route signs, or US Bicycle Route signs.
- Route sign auxiliaries carrying word legends that are used on bicycle routes should have a minimum size of 12 x 6 inches.
- Route sign auxiliaries carrying arrow symbols that are used on bicycle

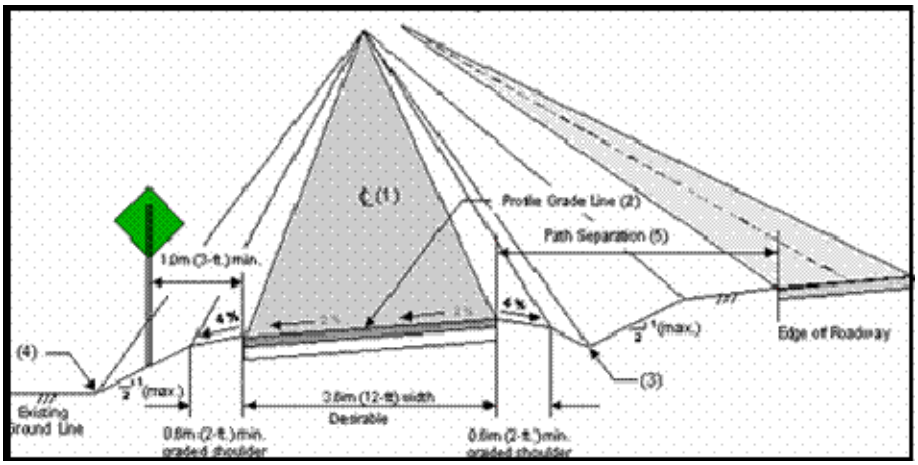
routes should have a minimum size of 12 x 9 inches.

- All route sign auxiliaries are to match the color combination of the route sign that they supplement.
- Destination may be mounted below Bicycle Route Guide to furnish additional information, such as directional changes in the route, or intermittent distance and destination information.

Shared-Use Path Standards

As the City proceeds to extend the Interurban, Green River and Soos Creek trails, a consistent design standard should be used. The City should consider adopting those standards set forth in FHWA's *Designing Sidewalks and Trails for Access* for ADA compliance and AASHTO *Guide for the Development of Bicycle Facilities.* See **Figure E-13** for a typical cross-section. AASHTO considers ten feet as *recommended* pavement width (8 feet is *adequate* under low volume conditions), but 12 or 14 feet as *desirable* if significant volume and mix of users (jogger, walkers, cyclists, etc.) is present.

Figure E-13. Example Cross Section of Two-Way Shared Use Path on Separate Right-of-Way



Sidepaths

Some of Hailey's streets were constructed prior to the City's adoption of urban street standards, and hence lack sidewalk facilities on both sides of the street. Some of these streets have since been fitted with "sidepaths" - asphalt paths adjacent to and along one side of local streets rather than a sidewalk with curb and gutter.

A General Definition of "Sidepaths"

In general, these one-sided pedestrian pathway facilities are considered "sidepaths" and are likely to attract two-way, pedestrian and bicycle travel, regardless of their width.

Sidepaths are typically built parallel to roadways in the usual location for sidewalks, but differ from sidewalks in that they are 10-foot-wide, designed for shared use, and require a barrier or five-foot or greater separation from the roadway. They are called "sidepaths" because local laws often prohibit bicycle use on "sidewalks", and they are proliferating because the right-of-way is in public ownership.

Sidepaths are a design **not covered** in the *AASHTO Pedestrian Guide,* which is used by many cities and counties as the base design guideline and policy for pedestrian facilities.

Liability Aspects of Sidepaths

As "sidepaths" are used by both pedestrians and cyclists, perhaps the best summary regarding liability was prepared by bicycle design and planning experts. The paper *Liability Aspects of Bicycle Environments: Bicycle Facilities and Roads*, by three notable experts on bicycle transportation, Alex Sorton, P.E., Tom Walsh, P.E. and John Williams was presented at the Institute of Traffic Engineers 1990 Annual Meeting and specifically recommends against sidewalks and sidepaths as bicycle facilities. Here are extracts from that paper:

A commuter bicyclist was riding on a designated bikeway. This bikeway had been created on the curbside half of an existing 10-foot sidewalk. Signs and markings were used to designate the facility and parking was allowed adjacent to the curb. A driver, while making a right turn into an alley, failed to see a bicyclist on the bikeway, primarily because a parked vehicle blocked the view, and ran over him. The bicyclist was severely injured.

The bicyclist sued the operating agency claiming negligent design. He pointed out that the AASHTO Guide strongly suggests not placing bikeways on a sidewalk adjacent to a street because of the sight obstruction created by parked cars.

Special pedestrian and bicycle accommodations should always reflect current guidelines and sound judgment. Some states, including Washington, have established their own design guidelines, which should be used where applicable. The courts and practitioners have often recognized the 1999 AASHTO Guide and the Manual on Uniform Traffic Control Devices (MUTCD) as guiding design policy. Adherence to these sources can help the City avoid possible future judgments.

AASHTO Guide Highlights

The AASHTO Guide is easily summarized by the following two recommendations:

- Don't put two-way bikeways on one side of a street. Such facilities cause serious conflicts at intersections and driveways. Two-way bike lane use has led to a number of fatal head-on collisions. And such facilities encourage wrong-way riding.
- Don't designate sidewalk bikeways.

Sidewalk Bike Paths Often Fail.
(1) Each driveway can be a conflict to bicyclists. Half of all riders come against traffic. (2) Where does the designer place the facility laterally? Too close to the road and there are serious operational problems. The motorist blocks the path, and some bicyclists are inclined to go to the front. Too far back the turning motorist picks up speed and fails to notice the crossing. This motorist lost in court when the bicyclist was injured while going in front.

As further context, the proximity of two-way, shared-use paths (or sidepaths) to adjacent streets can cause several operational problems. The following section is excerpted from the *Florida Department of Transportation Bicycle Design Guideline* (1999):

Unless shared use paths are paired, they require one direction of bicycle traffic to ride against motor vehicle traffic, contrary to normal rules of the road. This movement greatly increases certain types of bicycle crashes. The designer is often left with complex placement issues. Should the facility be placed close to the highway creating turning/merge conflicts at the intersection? Should it be placed at the back of the right-of-way, increasing detection problems at each driveway and intersection? Shrubs, other vegetation and fencing can hide the bicyclist from the motorist.

When the path ends, bicyclists going against traffic will tend to continue to travel on the wrong side of the street. Likewise, bicyclists approaching

a path often travel on the wrong side of the street to get to the path. Wrong-way travel by bicyclists is a major cause of bicycle/automobile crashes and should be discouraged at every opportunity.

At intersections, motorists entering or crossing the roadway often will not notice bicyclists coming from the right, as they are not expecting or looking for contra-flow vehicles. Even bicyclists coming from the left (the expected direction) often go unnoticed, especially when sight distances are poor.

Bicyclists using the roadway are often subjected to harassment by motorists who feel that, in all cases, bicyclists should be on the trail instead. Many bicyclists will use the roadway instead of the shared use path because they have found the roadway to be safer, less congested, more convenient, or better maintained.

Bicyclists using shared use paths generally are required to stop or yield at all cross streets and driveways. Whereas, bicyclists using the roadway usually have priority over cross traffic, because they have the same right of way as motorists. This treatment is unfair to trail users and may be contrary to the *Manual on Uniform Traffic Control Devices.* In some cases, shared use paths may have such heavy volumes the cross street should be required to yield.

Stopped cross street motor vehicle traffic or vehicles exiting side streets or driveways may block the path crossing.

Because of the proximity of motor vehicle traffic to opposing bicycle traffic, barriers are often necessary. They keep motor vehicles separated from shared use paths and bicyclists from traffic lanes. These barriers can represent obstructions to bicyclists and motorists. They can complicate maintenance of facilities and cause other problems as well.

Many bicyclists' destinations may be on the opposite side of the street from where the bicycle path is located. This is a common situation when shared use paths are built along railway corridors or canals. In this case, the bicyclists' desire to access these destinations must be addressed.

- Using sidewalks as pathways further increases the hazards. Providing a sidewalk shared use path is unsatisfactory for a variety of reasons:
- Sidewalks are typically designed for pedestrian speeds and maneuverability.
- They are not safe for higher speed bicycle use.

- Conflicts are common between pedestrians and bicyclists. Pedestrians exiting stores or parked cars may surprise bicyclists.
- Conflicts with fixed objects (e.g., parking meters, utility poles, sign posts, bus benches, trees, fire hydrants, mail boxes, etc.) are also common.
- Walkers, joggers, skateboarders, in-line skaters and roller skaters can, and often do, change their speed and direction almost instantaneously, leaving bicyclists insufficient time to react to avoid collisions.
- Pedestrians often have difficulty predicting the direction an oncoming bicyclist will take.
- At intersections, motorists are not often looking for bicyclists (who are traveling at higher speeds than pedestrians) entering the crosswalk area, particularly when motorists are making a turn. Sight distance is often impaired by buildings, walls, property fences and shrubs along sidewalks, especially at driveways.

Summary

Hailey will need to evaluate and consider a number of their design standards and policies with respect to the full range of pedestrian and bicycle travel needs. The Hailey Design Guide identifies the sidewalk, curb ramp and driveway crossing standards that should be amended to best comply with the ADA. The Design Guide also identifies needed revisions to the City's street standards for consistency with the most recent federal bicycle standards and policies. Other policies and standards should be re-evaluated so the City can better provide a balance of transportation facilities to best meet the multi-modal needs and expectations of Hailey residents. FHWA's Designing Sidewalks and Trails for Access is an excellent, comprehensive resource for Hailey's use as it evaluates its broader design standards and policies with respect to pedestrian access. AASHTO's *Guide for the Development of Bicycle Facilities* is a good source for bicycle facility design features.

B – Street Design Guidelines

1. Re-Striping Arterial and Collector Street Lanes

As the City considers re-striping some of its arterial and collector streets with on-street bike lanes it may encounter the need to reduce travel lane widths and parking space. An excellent guide for consideration when reducing travel lane widths is ITE's *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*[xv]. In addition, the American Association of State Highway and Transportation Officials (AASHTO) AASHTO's Policy on Geometric Design (Greenbook) provides guidance on appropriate urban arterial and collector street lane widths. The Greenbook is supplemented by additional AASHTO policy guidance in "A Guide for Achieving Flexibility in Highway Design. The three sources together support the following ranges in lane width design (urban arterial and collector street speeds ranging from 25-35 mph):

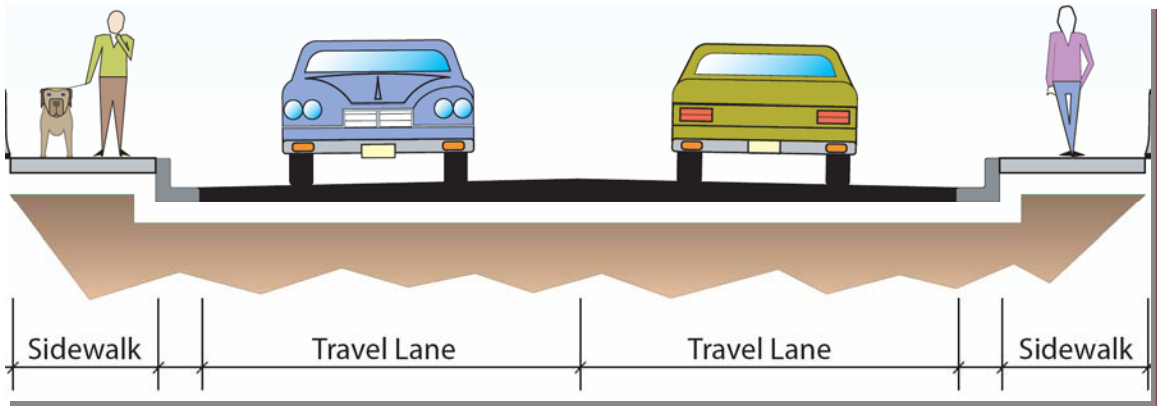
Urban Arterial Streets	10-12 feet
Urban Collector Streets	9-11 feet

2. Local Street Design Option

As part of the Draft TMP effort, discussions with City Staff and study participants included on the possible development of optional sidewalk design application along local streets within established Hailey neighborhoods. Further evaluation of recent design development and application completed by the City of Seattle provided a more meaningful option for Hailey's consideration.

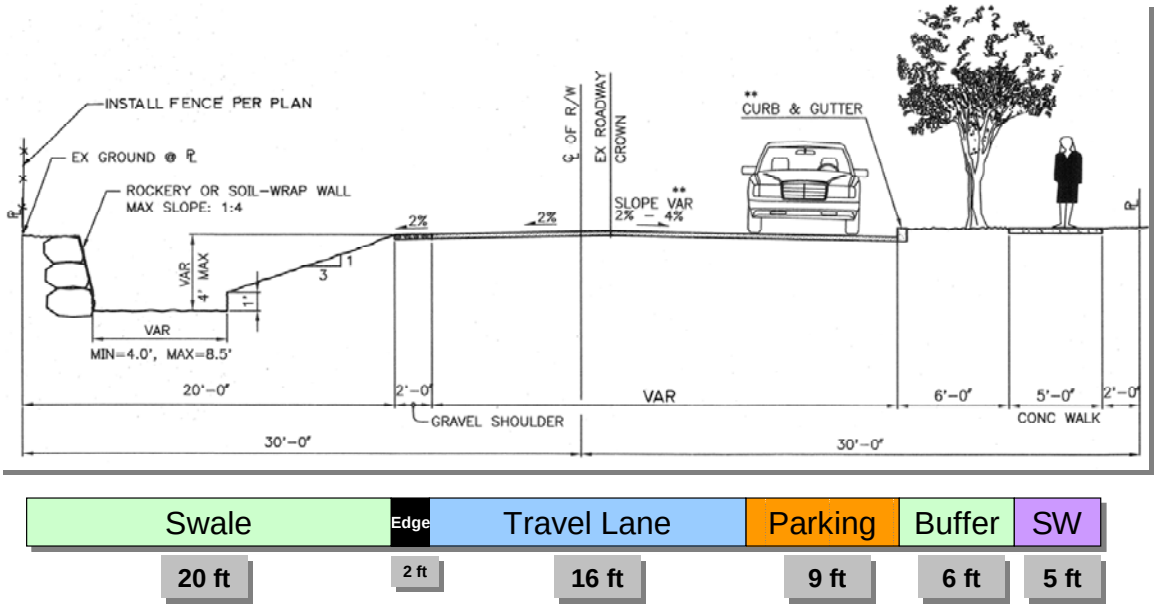
Option #1: Typical Local Street Design Standard: Curb, Gutter & Curbside Sidewalk
The city's current design standard is a curb, gutter and sidewalk cross-section as shown in **Figure E-14**.

Figure E-14: Typical Design Standard: Local Streets



Option #2: Seattle's SEA Street Model
There are alternative sidewalk corridor designs that may apply to Hailey, as shown in **Figure E-15**. For example, the City of Seattle redesigned a residential street without curb and gutter and constructed a sidewalk separated from the street edge. By design the pedestrian experience is intended to be more pleasant by plantings that separate the sidewalk from the street, as well as the addition of a drainage system in a swale on the opposite side of the street (rather than a traditional curb and gutter configuration). Seattle had estimated that the alternative design was found to be cheaper, when considering a variety of street improvement elements, including drainage system requirements.

Figure E-15: Seattle's SEA Street Design Concept



A summary of the pros and cons of Seattle SEA street design was generally made as part of the TMP effort and is summarized in **Table E-5**.

Table E-5: Pros and Cons of Seattle's SEA Street Design

PROs	CONs

▪ **May be cheaper than traditional curb/gutter/sidewalk design standard to construct**
▪ **SEA Cost Estimate per city block:**
  ▪ **$325,000 SEA St. Design**
  ▪ **$425,000 Traditional Design**
	▪ **Requires adoption and application of new residential street design standards**
	▪ **Cost of design not factored in to SEA estimates**

▪ **May be viewed having higher neighborhood aesthetics**	▪ **Requires seasonal maintenance, either by:**
	  ▪ **formal agreement with individual property owners; or**
	  ▪ **by additional program, revenue source and budget**

▪ **May require less off-site stormwater retention and treatment**	▪ **Likely requires similar funding enhancements through LIDs**

The Draft TMP determined that there is merit to testing the application of a similar SEA Street design in Hailey.

3. Stop Sign Policy

STOP Signs. A STOP sign is an effective traffic control device when used at the proper place under appropriate conditions, consistent with MUTCD requirements. Section 2B.05 of the MUTCD provides a detailed description of the appropriate guidelines that should be followed when installing or placing a STOP sign.

Multiway STOPS. Multiway STOP signs are used at intersections when traffic volumes on all approaches are approximately equal or where safety is a concern. According to the MUTCD, multiway stops should not be used for speed control or to arbitrarily interrupt traffic. When multiway STOP signs are installed at locations where they are not

warranted, motorists may disregard the traffic control devices. The requirements and guidelines for multiway STOPS discussed in Section 2B.07 of the MUTCD should be followed any time they are considered at an intersection.

Multiway STOPS Within Neighborhoods. As discussed above, guidelines within the MUTCD should be followed anytime a multiway STOP is installed. "Options" within Section 2B.07 of the MUTCD may allow for multiway STOPS within a neighborhood setting if an engineering study determines that the intersecting streets are similar in design and operating characteristics, and there are higher than normal pedestrian volumes at the intersection. Multiway STOPS may be considered within Hailey's neighborhoods at intersection locations meeting the "options" allowed by the MUTCD.

End Notes

[i] Americans with Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

[ii] Designing Sidewalks and Trails for Access; Part II – Best Practices Design Guide, U.S. Department of Transportation, 2002; and, Developing Curb Ramp Design Based on Curb Radius. Edward R. Stollof. Institute of Transportation Engineers Journal, April 2005.

[iii] Guide for the Planning, Design and Operation of Pedestrian Facilities, American Association of State Highway and Transportation Officials, 2004.

[iv] Pedestrian Facilities Users Guide – Providing Safety and Mobility, Federal Highway Administration, March, 2002.

[v] Guide for the Development of Bicycle Facilities, American Association of State Highway and Transportation Officials, 1999.

[vi] Manual of Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, 2004. See also Washington State Modifications to the MUTCD, M 24-01.

[vii] Americans with Disabilities Act Accessibility Guidelines, U.S. Access Board, 2002.

[viii] See FHWA Memorandum, July 30, 2004. "The US Access Board, the federal agency responsible for developing accessibility guidelines under the Americans with Disabilities Act (ADA), published the ADA/ABA Accessibility Guidelines (ADA/ABA-AG) on July 23, 2004. The Access Board is charged with developing minimum guidelines to assist the Department of Transportation (DOT) and Department of Justice (DOJ) in establishing design standards. Although the publication of these guidelines marks the completion of the Access Board's responsibilities, these guidelines will not become ADA standards until the Departments of Justice and Transportation go through standard notice-and-comment rulemaking to adopt the new guidelines into the standards they maintain under the ADA, a process which is expected to take one to two years. In the interim, agencies must continue to use current ADA standards -- including those for detectable warnings at curb ramps and blended transitions -- when building new and altering pedestrian facilities. Therefore, there have been no changes to the existing requirements (since July 26, 2001) that detectable warnings must be applied to curb ramps in new construction and alterations.

As part of updating the guidelines, the Access Board has developed more specific guidelines for public rights-of-way. On June 17, 2002 the Board released a draft of these guidelines for public comment in advance of publishing a proposed rule. Included are provisions for sidewalks, curb ramps, street crossings and related pedestrian facilities that are not addressed in the newly published ADA/ABA-AG. Both FHWA and the Access Board encourage use of the June 17, 2002 draft's scoping and technical provisions for detectable warnings as an equivalent facilitation to the current requirements in the 1991 (current) ADAAG.

USDOT is an implementing agency for the title II of the Americans with Disabilities Act and for section 504 of the Rehabilitation Act; the FHWA is the USDOT agency responsible for overseeing Title II and 504 compliance for pedestrian access in public rights-of-ways. USDOT is evaluating the ADA/ABA-AG and considering possible changes to USDOT section 504 regulations to reflect current detectable warning requirements until such time as the new public rights-of-way guidelines can be issued. The FHWA MUTCD staff are also pursuing inclusion of detectable warnings in Chapter 3 Markings. NCHRP and FHWA research is also underway to improve truncated dome maintenance and contrast."

[ix] Context Sensitive Solutions in Designing Major Urban Thoroughfares fro Walkable Communities. An ITE Proposed Recommended Practice. Institute of Transportation Engineers, 2006.

[x] Guide for the Planning, Design and Operation of Pedestrian Facilities. American Association of State Highway and Transportation Officials, 2004.

[xi] Association of American State Highway Transportation Officials. Guide for the Development of Bicycle Facilities, Washington, D.C. 1999.

[xii] Manual of Uniform Traffic Control Devices, U.S. Department of Transportation - Federal Highways Administration, 2004.

[xiii] Shared-Lane Pavement Marking Study, City of San Francisco, February 2004.

[xiv] Shared-Lane Pavement Marking Study, City of San Francisco, February 2004.

[xv] *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, Institute of Transportation Engineers, 2006*.