

Lebanon Trails Strategic Plan



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EXECUTIVE SUMMARY

INTRODUCTION

The *Lebanon Trails Strategic Plan* is intended to provide a conceptual framework for the development of an interconnected, multi-use, trail system. A survey of Lebanon residents conducted for the *City of Lebanon Parks Master Plan*, adopted in May 2006, identified walking/hiking, as the most common outdoor activity enjoyed by Lebanon citizens. The proposed trail system will provide Lebanon's citizens and visitors with new opportunities for safe and close-to-home access to an ambitious, well planned, and well connected community trail system. This will bring the City of Lebanon to the forefront of communities that are actively promoting the advancement of community health, wellness, and overall quality of life.

The original Lebanon Trail Plan is based upon the trail map developed by the University of Oregon's Community Planning Workshop in May 2006. As an addendum to the *City of Lebanon Parks Master Plan*, this strategic plan refines the trail map further by research and development of the following 6 elements:

Trail Alignment, Design, and Features – Alignment, Design, and Features are the factors that define a trail system.

Maintenance Plan – Based on the City of Lebanon trail maintenance performance standard, adopted January 1st, 2006.

Existing Conditions and Proposed Trails – Provides an update to the trails inventory conducted for the *City of Lebanon Parks Master Plan*.

Trail Development Priority – Prioritizes trail development based upon desirable trail conditions and attributes.

Projected Cost – Cost of the entire trail system built to proposed standards. Includes land acquisition.

Potential Trail Funding – Potential sources for trail development funding.

TRAIL ALIGNMENT, DESIGN, AND FEATURES

Trail alignment, trail design, and trail features are elements that define the purpose of a trail, who will use the trail, and what level of service they may expect. These elements also influence the long term sustainability of a trail system. Sustainable practices to be carried out through trail development include:

- Forming protective buffers along waterlines.
- Access that attracts and encourages physical activity that is close to home, which is proven to lower the risk of many health associated costs.
- Reuse of existing material for trail construction or features.
- Creating pathways that access natural amenities, while preserving environmentally sensitive areas.
- Management practices and volunteer projects that include removal of non-native plant species, reducing the need for herbicides.

- Protection of riparian areas which will improve water quality, contribute to lower water temperature, and promote fish habitat.
- Sustainable trail design practices include; adequate slope for drainage, use of recycled materials where available, and utilization of natural areas and greenways in trail alignments.

Trail Alignment

Trail alignment was determined by identifying 2 or more points for the proposed trail to connect. The best trail alignment between the two points is generally one that will provide a safe and enjoyable recreational experience while minimizing potential conflicts. The recommended trail alignments contained in this plan attempt to do that by providing routes that utilize street rights-of-way, utility corridors, greenways, rivers, and park access routes to link open spaces, residential neighborhoods, existing parklands, places of commerce, public facilities, civic buildings, and school sites.

Other factors that may have a substantial influence on final trail alignment include; existing easements, City of Lebanon owned property, supportive landowners, natural pathways, and future neighborhood development.

Trail Design

The proposed trail system will continue using the design standards currently being used for trail development. If possible, trail design should attempt to meet the following standards;

- 15 – 100 foot wide trail corridor. 15 foot minimum width. Wider where possible/feasible or where riparian zones or conservation easements can be included as open space or natural area.
- 4 – 12 inch thick aggregate trail base.
- 2.5 – 4 inch thick asphalt surface.
- 12 foot wide asphalt trail. 10 foot wide or less may be adequate in areas with width restrictions.
- 12 – 36 inch wide soft surface shoulder on one or both sides of the trail for use by joggers/walkers preferring soft surface.
- Compliance with ADA accessibility standards.

These design standards will help ensure the overall trail system is adequate for a variety of uses and minimizes conflict between user groups. By complying with ADA accessibility standards, the trails will provide interesting, varied, convenient, and accessible trails to all of Lebanon’s citizens, including those with limited mobility. Standards may vary where necessary to meet the specific needs of a trail project or overcome project constraints.

Trail Features

Trail features are recommended to increase safety and convenience, and improve the overall recreational experience for trail users. Trail features listed within this plan include; trailhead kiosks, benches, bridges, shelters, lighting, trash receptacles, water fountains, trailside art, bollards, and boardwalk sections. Trail signage is also addressed. Recommended trail signage includes; location, safety precautions, regulations, and difficulty ratings.

MAINTENANCE PLAN

The City of Lebanon takes pride in maintaining public use areas and will continue to provide that level of commitment to the expanding trail system by utilizing a trail maintenance performance standard, established in January, 2006 (Appendix D). Regular maintenance will ensure that trails be maintained to a level that allows continued utilization by the public, but will not change the purpose of design of a trail.. Trail maintenance will also include continuing partnerships with community groups and individuals partaking in the Adopt-a-Trail and the Adopt-a-Park programs, administered through the City of Lebanon's Maintenance Division.

EXISTING CONDITIONS AND PROPOSED TRAILS

Existing Conditions

The Existing Trails Inventory describes all of Lebanon's existing trail sections. Included in the inventory is an Existing Sidewalk/Trail Connections list, i.e., trails proposed in areas that have existing sections of sidewalk. While these are not multi-use trails, sidewalk/trail connections do provide connectivity, and are utilized to a small extent within the trail system. Widening of these sidewalks should be considered where practical to allow a minimum width trail corridor.

Proposed Trail Routes

This section provides background information regarding each individual trail section, including; trail location, overall goal, length and type of trail, significance, opportunities, and areas of concern. These recommendations attempt to utilize the topography, existing conditions, landowner support, and City owned property to propose the best trail route.

Summary of Total Distances

The following distances reflect the entire length of the Lebanon Trail System, the entire length of existing land and water trails, and total proposed trail distances. Total proposed trail distance was derived by subtracting the existing trails distances from the entire proposed trail system length.

- Entire trail system length – **58.27 miles**
 - Proposed and existing land trail – 50.0 miles
 - Proposed and existing water trail – 8.26 miles
- Total length of existing land and water trail – **12.72 miles**
 - Existing paved trail – 4.01 miles
 - Existing sidewalk connections – 5.34 miles
 - Existing soft surface trail – 1.40 miles
 - Existing water trail – 1.97 miles
- Total proposed recreational trail distance – **45.55 miles**
 - Proposed paved 12 foot wide trail – 37.16 miles
 - Proposed Water Trail – 6.30 miles
 - Proposed soft surface trail – 2.09 miles

TRAIL PRIORITY

Trail Categories

Trail sections are categorized based upon their intended use and current ownership/location. Trail sections may fall into more than one category.

The trail categories are:

- Entirely City-owned or public Right of Way (R.O.W.)*
- Private ownership w/ some City ownership, Right of Way R.O.W.* or easements**
- Partially developed (sidewalk)
- Private ownership w/o any City ownership, R.O.W*. or easements**
- 100% existing sidewalk
- Water trails

*Source: Lebanon Information Mapping System v3 (LIMS).

**Source: Linn County GIS maps. Online; available: <http://www.co.linn.or.us/webmap/>.

Top category trails are the highest priority since they are the most readily available for development. This means that those trails in the “Entirely City-owned or public right of way” category are the highest priority candidates for development, followed by trails in the “Private ownership w/some City ownership, R.O.W. or easements” category, and so on.

Water trails are listed last not because they are least important, but because they are an entirely different type of trail. Some of the land trails scoring points do not apply to water trails, which makes separate prioritization necessary.

Priority Scoring Matrix

After categorizing each trail section, the sections are entered into a scoring matrix and scored based upon their answers to a series of questions. The questions measure the opportunities, significance, and areas of concern for development of each proposed trail section. Trails scoring the highest are given higher priority.

COST ESTIMATE

The total projected cost involves two main factors; cost of land acquisition, and cost of materials

Land Acquisition

The land acquisition cost estimate was completed by deriving an average cost-per-acre price of all properties adjacent to an existing or proposed trail using The City of Lebanon’s 2009 GIS database taxlot information*. Included in the database were the “Total market land value” and the “Total calculated acreage” for each one of the 794 taxlots lying within 30 feet of a trail corridor. Dividing the “Total market land value” by the “Total acreage of adjacent lots” results in the average cost per acre of adjacent taxlots. The total acquisition cost can then be calculated.

The following information was used to estimate the cost of land acquisition:

- Number of taxlots adjacent to proposed trail system – 794
- Total acreage of adjacent taxlots – 4048.38
- Total market land value of adjacent taxlots – \$136, 208, 230
- Average \$/acre of adjacent taxlots – \$33,645/acre – (\$136,208,230/4048.38 acres)
- Minimum required acreage – 47.31 acres**
- Land acquisition cost – **\$1,591,745** – (\$33,645/acre * 47.31 acres)

*LEB_DATA.GIS.Taxlot. Updated 05/14/09. Accessed 07/08/09

**Minimum required acreage includes only privately owned land within the 15 foot minimum corridor width required for trail construction.

Cost of Materials Estimate Assumptions

The assumptions listed below were used to estimate cost of materials.

- Asphalt cost - \$60/ton*
- Asphalt width – 12 feet
- Asphalt thickness (maximum) – 4 inches**
- Asphalt thickness (minimum) – 2.5 inches***
- Asphalt density value – 4,050 lbs/yard³
- Crushed aggregate base cost – \$15/ton*
- Crushed aggregate base width – 14 feet
- Crushed aggregate base thickness (maximum) – 12 inches**
- Crushed aggregate base thickness (minimum) – 4 inches***
- Crushed aggregate density value – 3,800 lbs/yard³

*Assumption is based upon the price of laid Crushed Aggregate Base and hot mix Asphalt that the City of Lebanon received as of June, 2009.

**Maximum crushed aggregate and asphalt thickness is sufficient to withstand the heaviest use intended without degradation. The heaviest intended use requires that the trail can be used as a service road for maintenance vehicles and associated equipment.

***Minimum crushed aggregate and asphalt thickness is sufficient to withstand non-motorized pedestrian use without degradation

No other costs, such as engineering, fabric, clearing, or excavation were included in the estimate.

In many cases, the minimum width and thickness of materials will be used. Increased thickness of base material and asphalt will be necessary where trails are used as service roads. Such trails will require added thickness of aggregate base and asphalt to be regularly used by maintenance vehicles and equipment without experiencing degradation.

Trail Construction

Linear foot construction cost (maximum thickness) – \$35.81/linear foot*

Linear foot construction cost (minimum thickness) – \$16.18/linear foot*

Minimum required multi-use trail length – 196,210 feet

Construction cost – (maximum thicknesses) – **\$7,026,280**

Construction cost- (minimum thicknesses) – **\$3,174,678**

*Linear foot cost is based upon the price of laid Crushed Aggregate Base and hot mix Asphalt that the City of Lebanon is receiving as of June, 2009 and does not include the cost of land acquisition.

Total Cost

The Total Cost estimate is the sum of land acquisition, crushed aggregate base, and laid hot mix asphalt costs.

Using maximum thickness estimate– **\$8,618,025**

Using minimum thickness estimate – **\$4,766,423**

Total development average estimate – **\$6,692,224**

Maintenance

Acreage is base upon the area (50 miles of land trail multiplied by the 15 foot minimum trail corridor width) of land trail after development of all trail sections.

Total minimum required acreage – 90.95 acres

Maintenance cost - \$1,000 per acre*

Yearly maintenance cost - **\$90,950**.

*Cost of maintenance per acre of developed parkland found in *The City of Lebanon Parks Master Plan*.

POTENTIAL TRAIL FUNDING

The funding section of this plan contains detailed descriptions of the following potential trail funding sources.

- Bonds
- Capital Improvements Program
- Donations
- Easements
- Gas Tax
- Grants - Funding table can be found in Appendix C.
- Land Trusts
- Local Improvement District
- Parks and Recreation District
- Park Utility Fee
- Partnerships
- Property Exchange
- Rails to Trails/Rails with Trails
- Special Serial Levy
- Supportive Landowners
- System Development Charges
- Transient Room Tax

By using a combination of the above funding sources, the City of Lebanon will gain consistent opportunities for trail development projects.

These projects will move the community toward achieving an interconnected trails system that connects the resources and amenities of Lebanon, making a positive impact upon the community for generations to come.

From the beginning stages of determining trail alignment through the securing of needed funding, this strategic plan will provide the framework within which development of an accessible and interconnected community trail system becomes possible.

INTRODUCTION

TRAIL AND PATHWAY DEVELOPMENT

Trails and pathways are an important component of the *City of Lebanon Parks Master Plan*, adopted by the City of Lebanon in March 2006. The goal contained within that plan regarding trail and pathway development is as follows:

“Goal 6: Trails and Pathways. Develop pedestrian paths and trails along street rights-of-way, utility corridors, greenways, rivers, and park access routes linking open spaces, residential neighborhoods, existing parklands, places of commerce, public facilities, civic buildings, and school sites.”

The following passage is the definition for trails and pathways used within the *City of Lebanon Parks Master Plan*:

“Trails and Pathways are public access routes and trail-oriented recreational activities including sidewalks, bikeways, multi-use trails and paths. These emphasize safe travel for pedestrians to and from parks and around the community. Trails and Pathways provide opportunities for connection between park facilities and neighborhoods. They provide a variety of trail-oriented activities and can help reduce dependence on the automobile. Trails are described by the predominant activity, such as Hiking, Nature/Interpretive, Historic, Multi use, Exercise, Bikeways.”

The goal of this Strategic Plan is to facilitate the development of Lebanon’s proposed trail system by providing a conceptual framework for the development of all trail segments.

CITY OF LEBANON FACILITIES PLANS

The *Lebanon Transportation System Plan* supports the development of new multi-use trails as a means of filling in the gaps in the City’s pedestrian facilities. The *Capital Improvements Program 2008 – 2012* includes several trail development projects intended to expand recreational opportunities and improving overall connectivity within the community.

ZONING

As recreational trails are a part of public use facilities, they are permitted in most zones. The *Lebanon Development Code* allows conditional use approval, or approval upon administrative review, of recreational trails in the following zones:

Residential Low Density (Z-RL)	Neighborhood Commercial Zone (NCM)
Residential Mixed Density (Z-RM)	Central Business Commercial Zone (Z-CCM)
Residential High Density (Z-RH)	Highway Commercial Zone (Z-HCM)
Mixed Use Zone (Z-MU)	Public Use Zone (Z-PU)
Neighborhood Mixed Zone (Z-NMU)	

Recreational trails are not permitted in Industrial Use Zones (Z-IND), but may be permitted upon administrative review if the proposed project implements the City's adopted facilities plan.

THE PLANNING PROCESS

The process for development of this plan essentially consisted of three steps. The first step was to collect relevant background information regarding the development of a recreational trails system. This included research of existing trails plans, an inventory and evaluation of Lebanon's existing trails, and a review of steps needed for trail development.

Step two was to assess the needs of the community, and the areas of opportunity for meeting those needs. This was determined primarily through resources such as the *City of Lebanon Parks Master Plan*, contact with City personnel and public input gathered during public meetings held by the Linn County Regional Trails Committee, local volunteer trails advocacy group Build Lebanon Trails (BLT), Lebanon Parks Committee and public meetings held during the development of the Cheadle Lake Recreational Area Conceptual Plan.

The final step in the planning process was to develop criteria and recommendations for development of new trail sections.

The Lebanon Trails Strategic Plan provides detailed descriptions and information on each trail section. These recommendations have been reviewed by the BLT Steering Committee, Lebanon Maintenance Services Division, Public Works, Parks Committee/Tree Board, and the City Manager before acceptance as an addendum to the *City of Lebanon Parks Master Plan*.

The entire planning process is summarized below:

1. **Inventory and Analysis** – Background trail information, existing trails, trail conditions, areas of opportunity, City controlled trail corridors.
2. **Needs Assessment** – *City of Lebanon Parks Master Plan* and related planning document research. Public input and stakeholder involvement. Determination of trail priority.
3. **Strategic Plan** – Final recommended trail route, land acquisition, trail maps, trail features, improvements, and funding options.

GOAL

The following goal and specific objectives were taken from the *City of Lebanon Parks Master Plan* and are statements of the community's goals as they relate to development of recreational trails.

GOAL 6: "Develop pedestrian paths and trails along street rights-of-way, utility corridors, greenways, rivers, and park access routes linking open spaces, residential neighborhoods, existing parklands, places of commerce, public facilities, civic buildings, and school sites."

- Objective 6.1.** Work collaboratively with the Trails Committee to develop and implement the Trails Plan.
- Objective 6.2.** Expand trails and connections utilizing areas within the floodplain, easements, and parklands to areas not currently served, including both developing and established areas of the city.
- Objective 6.3.** Enhance trail signage and create trailheads and kiosks for education and interpretative services.

BENEFITS OF A TRAIL SYSTEM

This trail system will provide recreational opportunities, transportation routes, revenue, educational opportunities, and linkages to natural areas, cultural and historical attractions, and Lebanon's many residential areas.

Recreation and Health

The trails provide recreational opportunities for residents, tourists, and adjacent communities. Another benefit is that the increased opportunity for active, outdoor activities that a well connected trail system provides can help reduce the risks of weight-related health problems within the community.

Transportation

Trails increase transportation choices by creating non-motorized travel routes connecting residential areas with major destinations and motorized and transit routes. Lebanon's trail system provides routes for residents to recreational areas, work, schools, businesses, and civic buildings.

Economic Benefits

Trails increase the quality of life in a community, which can make an area more attractive for business relocations and in-migration. According to the National Association of Homebuilders, the most desired amenity of prospective buyers is trails*.

*Source: OC Register. Online; available: <http://marketing.irvinecompany.com>. Accessed 6/29/09.

Education

Trail development projects can serve as outdoor classrooms to teachers and students, members of the community, and scientists in a wide range of studies including biology, ecology, geography, and history. Completed trail corridors will continue to provide these outdoor educational opportunities.

Linkage to Natural Areas

Lebanon's trail system is designed to provide access to several significant physical features that could provide recreational enjoyment to trail users. The most noteworthy features include the

South Santiam River, Ridgeway Butte, Cheadle Lake, Burkhart Creek, Oak Creek, Marks Slough, Walden Ponds, and the Albany-Santiam Canal.

Cultural and Historic Attractions

Connectivity includes cultural and historic sites within Lebanon. These sites include:

Lebanon Pioneer Cemetery
Santiam Wagon Road Trail
Santiam Travel Station

Elkins Flour Mill
Academy Square
Cheadle Lake

Current and Future Connection to Surrounding Trails

A community trail system will position Lebanon for future connection to one or more regional trails. Possible regional trail connections include:

Current:

Santiam Wagon Trail

Future:

The Willamette Valley Birding Trail
Willamette Valley Scenic Bikeway Route
Linn County Parks Trails
US Forest Service Trails
BLM Trails
Rails to Trails
Albany – Lebanon Trail
South Santiam River Water Trail
Willamette River Water Trail

TRAIL ALIGNMENT, DESIGN, AND FEATURES

Trail alignment, design, and features are the three most influential factors in determining the purpose of a trail, who will use it, and what level of service will be provided. Proper trail alignment is vital in avoiding problem areas where a trail could experience adverse conditions, low use, high maintenance, and possible relocation resulting in greater long term cost. Trail design also determines the type and amount of materials needed to complete development. Trail features may also improve the trail experience by creating a more user-friendly environment.

Trail alignment, design, and features have many long lasting impacts, including the sustainability of the trail system. Some sustainable practices to be established during trail development projects include:

- Forming protective buffers along waterlines.
- Access that attracts and encourages physical activity that is close to home, which is proven to lower the risk of many health associated costs.
- Reuse of existing material for trail construction or features.
- Creating pathways that access natural amenities, while preserving environmentally sensitive areas.
- Management practices and volunteer projects that include removal of non-native plant species, reducing the need for herbicides.
- Protection of riparian areas which will improve water quality, contribute to lower water temperature, and promote fish habitat.
- Sustainable trail design practices include; adequate slope for drainage, use of recycled materials, and utilization of natural areas or greenways in trail alignments.

TRAIL ALIGNMENT

The following list is taken from *The City of Lebanon Parks Master Plan* and provides several guidelines for the proposed trail system.

- The primary purpose of recreational trails is to provide a recreation experience. Transportation to other parts of the community should be the secondary objective. However, if trails connect to each other, the parks, and the urban infrastructure, they also promote park use, and can be a step in favor of non-motorized transport, resulting in healthier residents and a healthier, more sustainable environment.
- Whenever possible, recreation trails should not be part of a street roadway.
- Recreation trails should be interesting to the user and capitalize on scenery or other enjoyable sights. Trails that follow natural watercourses, traverse interesting scenery or cross areas of outstanding beauty should provide an interesting and enjoyable experience for the trail user.
- Trails should be looped and interconnected to provide a variety of trail lengths and destinations.
- Trail routes should take into account soil conditions, surface drainage and other physical limitations that could impact the area from over-use.
- Where trail routes use existing streets, the pathways should be designed to minimize the conflicts between motorists and the user.

- Some trails should be barrier-free and meet or exceed ADA requirements for accessibility.
- The trail system should be designed to link various parts of the community as well as existing park sites.

Several trail sections are proposed in areas with existing sidewalks. When routine sidewalk or pedestrian improvements are to be made on these sections, increasing their width to one that can accommodate a multi-use trail should be considered.

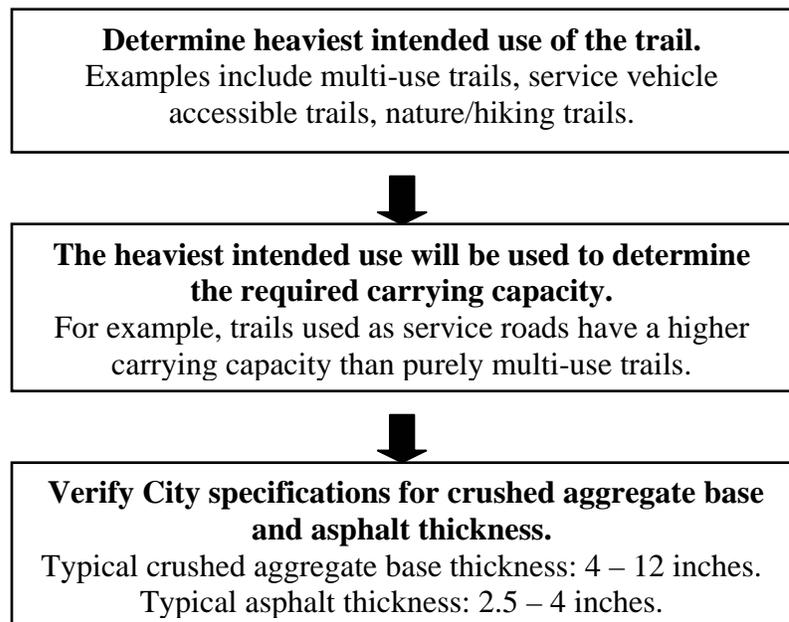
TRAIL DESIGN

General Standards

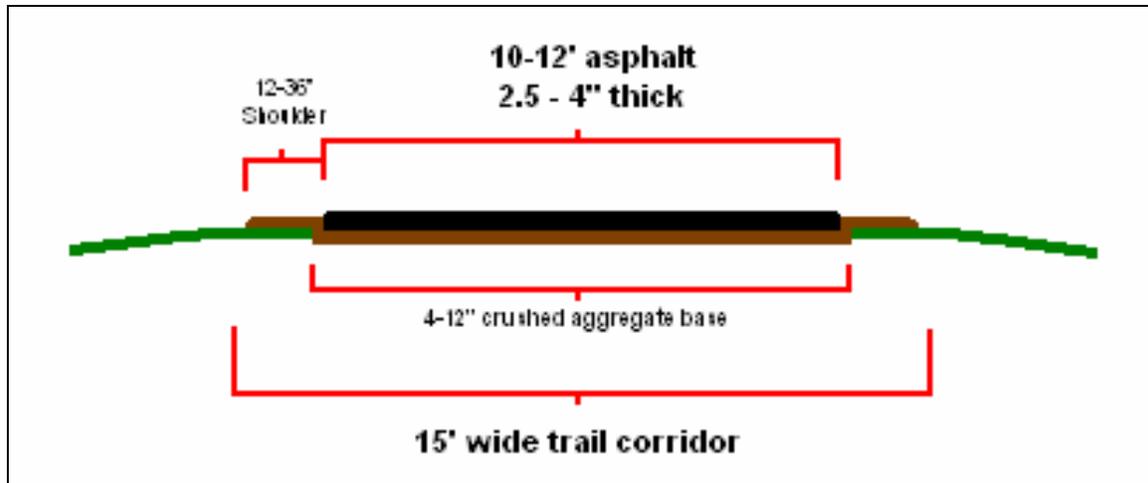
- A minimum trail corridor width of 15 feet is desired for construction and maintenance of trail segments.
 - Wider trail corridors are preferable wherever possible. Wider corridors allow for more open space, natural surroundings, and amenities.
- Grading may be necessary to provide a level surface within the area to be used as trail.
- The paved surface should be 12 feet wide, 10 or less may be sufficient.
 - Trail sections with width restrictions should be evaluated on a case by case basis to determine if a trail width less than 10 – 12 feet is acceptable. If a width less than 10’ is unacceptable, the trail route may have to be altered.
- Ideal trail design includes 12 – 36 inch wide soft surface shoulders.

Determining Trail Base and Asphalt Thickness

Thickness of aggregate base and asphalt will vary depending upon the intended trail use. A trail intended for occasional use as a service road will require thicker crushed aggregate base and asphalt layers to accommodate heavier use. The following steps illustrate the process of determining trail base and asphalt thickness.



The following illustration is a cross section view of a typical trail, showing the normal range of width and thickness.



Drainage

Adequate drainage for all trails should include the following functions and benefits.

1. Stable conveyance of storm runoff.
2. Slowing down and attenuating floodwater, thereby spreading out peak water flow.
3. Promotion of infiltration and groundwater recharge.
4. Protection of overall water quality.
5. Reduce risk/avoid elevating risk of flood damage to surrounding area.

Drainage requirements will vary depending on trail location and should be researched through site visits.

Adequate drainage may be provided in a number of ways, including but not limited to;

- **Natural Drainageways**
Natural drainageways should be utilized wherever possible and construction of new natural drainageways should be considered where none naturally occur. These channels include natural vegetation along the channel shores which act to slow water flow, prevent channel erosion, and protect water quality.
- **Culverts**
Some trails will require culverts to allow for adequate drainage. The size and kind of culvert, and installation methods will be determined for each site on an individual basis.
- **Trail design**
2% cross slope for drainage is an appropriate trail design for trail sections located on existing cross grades.

ADA Accessible Trails

Recreational facilities should provide the highest practical level of access to people with disabilities. The previously listed trail design standards and the physical characteristics of the trail locations will ensure that requirements for handicap accessibility are met on nearly all trail sections. However, exceptions may occur where application of an accessibility standard would cause a change in the trail's setting or the purpose or function for which the trail was originally designed. In these cases, exceptions to the standards listed below are permitted.

Accessible trails are identified as meeting minimum guidelines established by the U.S. Access Board. The Access Board is the Federal Agency responsible for creating minimum accessibility guidelines under the ADA. In June 2007, the Access Board issued a *Notice of Proposed Rulemaking (NPRM) for Accessibility Guidelines for Outdoor Developed Areas*, covered under the Architectural Barriers Act. Eventually guidelines will be issued for those entities covered under the Americans with Disabilities Act. For multi-use trail development, the best available information is the NPRM for outdoor developed areas.

The ADA Accessibility standards listed below draw from the NPRM. Under the proposed guidelines pertaining to trail development, the minimum technical provisions are:

- Surface of accessible trails to be firm and stable.
- Clear tread width: 36" minimum.
- Tread Obstacles: 2" high maximum (up to 3" high where running and cross slopes are 5% or less).
- Cross Slope: 5% max.
- Running slope (trail grade) meets one or more of the following:
 - 5% or less for any distance.
 - Up to 8.33% for 200' max. Resting intervals no more than 200' apart.
 - Up to 10% for 30' max. Resting intervals 30'.
 - Up to 12.5% for 10' max. Resting intervals 10'.
- No more than 30% of the total trail length may exceed a running slope of 8.33%.
- Passing Space: provided at least every 1000' where trail width is less than 60".
- A minimum 80 inches overhead clearance.
- Openings in trail surfaces to be of a size that does not permit the passage of a ½ inch diameter sphere.
- Signs: shall be provided indicating the length of the accessible trail segment.

Source: American Trails Website. Online; available:

<http://www.americantrails.org/resources/accessible/ADASummFeb00.html> Accessed June 30, 2009.

Road Crossings

Road crossings for each trail will be evaluated on a case by case basis before a decision is made regarding the type of crossing design to provide trail users. Average Daily Traffic (ADT) and speed limits are two factors to consider in the decision making process. The following five road crossings should be considered in providing adequate safety to trail users.

1. **Unprotected** – This crossing has no device in place to slow traffic or alert drivers when approaching the pedestrian crossing area.

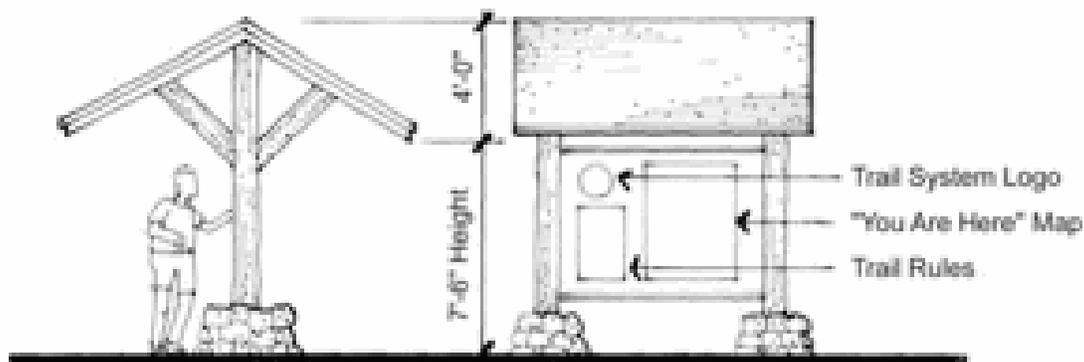
2. **Marked crossing** – Consist of a crosswalk or roadside signs to alert and/or slow drivers when they are approaching a pedestrian crossing area.
3. **Route users to existing intersections** – Trail sections crossing the road near (less than 250 feet) existing signalized intersections may divert trail users to the signalized intersection for safety purposes.
4. **Trail signalized/controlled crossing** – In many busy roadways, signalized/controlled crossings may be deemed necessary for safety reason. Trail signals are normally activated by push buttons, but also may be triggered by motion detectors. Typical costs for a signalized crossing range from \$150,000 to \$250,000.
5. **Grade separated crossing** – Both over-crossings and under-crossings are only considered a legitimate need in areas with extreme amounts of traffic, such as areas where ADT exceeds 25,000 vehicles, and 85th percentile speeds exceed 45 mph.

TRAIL FEATURES

To improve the overall quality of the recreational trails, the following list of trail features should be considered for inclusion in trail development.

Kiosks

Kiosks are to be located at trailheads and will contain all relevant signage, such as; safety precautions, location information, and trail regulations. Pictured below is an example of a trail kiosk design.



Kiosks will introduce the trail users to the trail, and provide them with enough information to confidently begin using the trail with a minimum amount of introduction.

Benches

Benches are very common along trails. Their locations are oftentimes concentrated in the most scenic or high use areas.



Bridges

Some trail sections require a pedestrian bridge for safety and correct trail alignment. The example pictured here is found near D Street, where a pedestrian bridge crosses Burkhart Creek.



Historic Sites Signage/ Placards

Descriptive signage can help to inform trail users of the historic nature of certain buildings or sites. This informational kiosk is located at the Santiam Wagon Road Trail.



Rest stop/Shelters

Rest stops and shelters located near trails and trailheads can provide an enjoyable stop for trail users. This shelter located at Gills Landing is an example of a rest stop/shelter design.



Light Fixtures

Lighting is considered a safety measure and is beneficial in certain areas. One example of trailside lighting is pictured here, located at Ralston Park.



Trash Receptacles

Trash receptacles are an important feature in high use areas. Trash receptacles should be considered where litter is an issue.



Drinking Fountain

Pictured to the right is an ADA accessible fountain located at Century Park.



Art Installations

Trails may feature artwork when it is possible to do so. An example is the mural pictured here, located at Mural Park on Main Street.



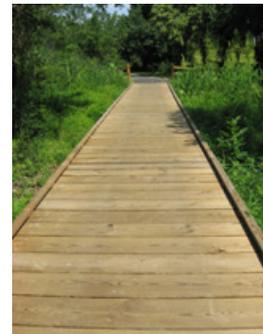
Bollards

Bollards, like the Marks Slough bollard pictured here, are used to prevent motorized use of the trail. Bollards are detachable for the purpose of allowing maintenance and emergency vehicle access.



Boardwalks

Boardwalks are an option where ground disturbance must be minimized. Wetlands are one area where boardwalks are commonly used.



Kiosk Signage

Trail Kiosk signage impacts how trails users interprets the trail. Kiosks should convey the following information through their signage;

- **Directional signage/trail location** – A comprehensive trails map may be used to orient the trail user and indicate surrounding trail options and areas of interest.
- **Safety precautions.** – Signage to alert trail users of any safety concerns.
- **Trail regulations.** – Trail regulations signs are to indicate prohibited uses. City ordinances are in effect on the trails.
- **Difficulty rating.** – Difficulty rating of each trail should be included at each kiosk and trailhead. The difficulty rating is based upon the trail type, conditions, steepness of grades, gain and loss in elevation, and the amount and kinds of natural barriers that must be traversed. Difficulty ratings can be determined using the following specifications.

Trail Type		Rating		
		Easy	Moderate	Difficult
ADA Accessible Trail	Grade	1-3%	3-6%	6-8%
	Trail Width	4'	4'	3'
	Surface	Concrete or Asphalt	Asphalt or very fine crushed rock	Hard packed soil with some rock and roots
Hiking/Nature Trail	Grade	20%	30%	30% or more
	Trail Width	18-24"	12-18"	12"
	Surface	Spot Gravel	Roots, imbedded rocks, some logs	No graded tread

Source: USDA Forest Service Website. Online; available: <http://www.fs.fed.us/r6/willamette/recreation/trails/index.html> Accessed June 30, 2009.

MAINTENANCE PLAN

Maintenance is routine or periodic repair of trails or trail segments to restore them to the standards to which they were originally designed and built. Maintenance does not change the purpose or design of the trail, but ensures that they are maintained to a level that provides continual service to the community.

As of January 1, 2006 the City of Lebanon utilizes a trail maintenance performance standard (See Appendix D) to guide trail maintenance.

Trail maintenance activities under this performance standard include:

1. Daily investigate and correct reported or noted maintenance concerns provided by trail users.
2. Weekly volunteers patrol each trail segment, pick up litter and report maintenance issues. (Assigned to volunteers who regularly use each trail segment)(Adopt-a-Park programs participants)
3. Bi-Annually, Each Spring and Fall
 - Complete trail condition assessment inspections using assessment forms.
 - Trim vegetation as necessary.
 - Mow trail shoulders as needed
 - Check culverts.
 - Power sweep all trail surfaces.
 - Inspect signing and repair as needed.
 - Inspect all trail structures for deficiencies.
4. Annually assess budgetary needs and address through the budget process.

This procedure is done once weekly or when a trail deficiency is reported. The purpose of this procedure is to provide a safe and clean, high quality trail area for the public to enjoy.

EXISTING CONDITIONS



Marks Slough Trail
Phase 1

SUMMARY OF EXISTING CONDITIONS

This summary contains a description of all developed multi-use trail sections owned and maintained by the City of Lebanon. This section also contains descriptions of existing soft-surface and water trails, and a summarization table of sidewalk/trail connections.

Existing Paved Trails – Completed Trail Sections

- **Burkhart Creek Trail (Section 6) – 991 feet**
The starting point for Section 6 of the Burkhart Creek Trail lies on the east side of South 12th Street, 1 block south of the Lebanon Fire Station. The trail leads south beside Burkhart Creek and includes a pedestrian bridge. The trail ends 500 feet north of F Street.
- **Marks Slough Trail (Phase 1) – 3,645 feet**
The existing Marks Slough trailhead is located on the west side of Tennessee Road approximately 100 feet south of the Tennessee Road Bridge over Marks Slough. The trail runs alongside the slough, ending at Beaton Lane, south of the Wastewater Treatment Plant.
- **Santiam Wagon Road Trail – 1,550 feet**
The Santiam Wagon Road Trail begins at the intersection of Cascade Drive and the South Santiam Highway. It travels north, alongside but set back from, the highway. The trail ends at the northeast end of the Wal-Mart parking lot.
- **West River Trail (Section 3) – 705 feet**
This trail lies between Riverview Elementary School and the South Santiam River. The trail leads behind the residential neighborhood located on Mayfly Street, and proceeds southward to the unimproved RiverView Park, located between Mountain River Drive and the South Santiam River.
- **Trail 1 (Section 2) (Hansard Avenue/Reeves Parkway) – 3,477 feet**
Trail 1 Section 2 consists of a 12 foot wide concrete path located alongside Hansard Avenue between Harrison Street and Reeves Parkway, and the 12 foot

wide asphalt trail located on the south side of Reeves Parkway between Hansard Avenue and North 5th Street.

- Trail 1 (Section 3) (Reeves Parkway) – 1,169 feet
Trail 1 Section 3 continues east alongside Reeves Parkway, beginning at the intersection of Reeves and North 5th Street, and ending at the Santiam Highway/Reeves Parkway intersection.
- Trail 2 (Pioneer School Trail) – 1,056 feet
Trail 2 travels alongside 5th Street, from Pioneer Elementary School north to Reeves Parkway and intersects with the existing sections of Trail 1.
- Trail 7 – 292 feet
Trail 7 leads through Ralston Park along the west side of the Lebanon-Santiam Canal.
- Trail 8 (Section 3) (7th Street Trail) – 2,568 feet
Trail 8 begins at the intersection of Walker Road and 7th Street and travels north on the east side of 7th Street before ending at the intersection of E Street and 7th Street.

Total Distance: 15,453 feet/**2.93 miles**

Existing Paved Trails – Partially Completed Trail Sections

- Burkhart Creek Trail (Section 14) – Paved Section – 543 feet
The paved portion of the Burkhart Creek Trail Section 14 is located on a trail corridor running along the north side of the Sand Ridge Charter School. The trail, and trail corridor, end 220 feet west of S. Main Road.
- West River Trail (Section 1) – Paved Section – 1,774 feet
The paved portion of the West River Trail Section 1 passes beneath the Grant Street Bridge, and connects River Park to Gills Landing. Two trail spurs run east/west along both sides of Grant Street, one serving as a trail connection to River Park, the other as a trail connection to Gills Landing.
- Trail 8 (Section 1) – Paved Section – 155 feet
The paved portion of Trail 8 Section 1 is located at Wynn Mill Park on South 4th Street.
- Trail 11 – Paved Section – 675 feet
The paved portion of Trail 11 is located in the eastern neighborhood of the Heather Estates subdivision and provides a connector trail between West Joy Street and West Jadon Drive
- Trail 12 – Paved Section – 488 feet
The paved portion of Trail 12 begins 30 feet east of the intersection of Weldwood Drive and Goldie Lane, and ends southeast at the connection with Oak Lane.
- Trail 18 – Paved Section – 705 feet
The paved portion of Trail 18 is located in southern Lebanon, along the south side of Wal-Mart.
- Trail 23 – Paved Section – 1,379 feet
The paved portion of Trail 23 is located in southern Lebanon, and lies on the north side of Crowfoot Road, between the South Main/Crowfoot and View Lane/Crowfoot intersections.

Total Distance: 5,719 feet/**1.08 miles**

Existing Completed and Partially Completed Soft Surface Trail Sections

- Cheadle Lake Trail (north shoreline) – 4,800 feet – Soft surface base and unimproved trail.
This trail begins at the Cheadle Lake North Entrance parking area. Gravel base has been laid traveling southeast to the land bridge for a distance of 2,400 feet. From the land bridge, the unimproved trail continues an additional 2,400 feet southeast to the Festival grounds. Funding for pavement is pending.
- Eagle Scout Trail – 1,995 feet - Completed
This trail begins at Gills Landing and travels south alongside the South Santiam River within the City owned frontage property.
- Trail 21 (Pioneer Cemetery) – 614 feet – Partially Completed
The existing soft surface portion of Trail 21 crosses the Pioneer Cemetery in two sections. The first section crosses from north to south, the second section from east to west.

Total Distance: 7,409 feet/**1.40 miles**

Existing Water Trails

- Cheadle Lake Water Trail – 5,200 feet
5,200 feet of improved water trail is located on Cheadle Lake’s north side.
- South Santiam River Water Trail – 5,180 feet
This unimproved water trail begins at Riverview Park and extends north to Gills Landing.

Total Distance: 10,380 feet/**1.97 miles**

Existing sidewalk/trail connections

The following tables list total trail footage created by the overlapping of proposed trails with City of Lebanon sidewalks. These are utilized within the proposed trail system as trail connectors, but are considered substandard. While they are substandard, they are also useful in reducing the cost of development and improvements in areas where sidewalks are in place.

When routine sidewalk or pedestrian improvements are to be made on these sections, increasing their width to one that can accommodate a multi-use trail should be considered.

<i>100% Existing Sidewalk/Trail Connection</i>	<i>Length (ft.)</i>
Oak Street Pedway (Section 3)	4,293
Oak Street Pedway (Section 4)	4,079
BCT Section 15	1,313
Oak Street Pedway (Section 2)	1,297
Trail 6	749
Trail 2 (Alternative A, Section 3)	553
Total distance: 12,284/2.32 miles	

<i>Partially Existing Sidewalk/Trail Connection</i>	<i>Length (ft.)</i>
Trail 16	3,327
Trail 9	2,416
Trail 17 (Alternative A)	2,249
Trail 1 (Section 1)	1,803
Trail 15	1,377
Trail 18	1,092
Trail 11	1,021
Trail 2 (Alternative A, Section 2)	874
Trail 8 (Section 2)	781
Trail 21	732
Trail 19	255
Total distance: 15,927/3.02 miles	

Summary

- Existing paved trail – 21,172 feet/4.01 miles
- Existing sidewalk connections – 28,211 feet/5.34 miles
- Existing soft surface trail – 7,409 feet/1.40 miles
- Existing water trail – 10,380 feet/1.97 miles
- Total length of existing land and water trail – 57,172 feet/**12.72 miles**