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Management, Development & Maintenance Plan For Lamoille Valley Rail Trail

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Management, Development & Maintenance Plan For the Lamoille Valley Rail Trail

1.0 Executive Summary

The Lamoille Valley Rail Trail (LVRT) will be a year-round multi-use recreation and alternative transportation facility (ATF). The LVRT will be located on the premises and right-of-way, as described in the lease executed between the Vermont Agency of Transportation (VTrans) and the Vermont Association of Snow Travelers, Inc. (VAST) on September 20, 2006, of the original St. Johnsbury and Lake Champlain Rail Road Company established June 30, 1916 and most recently managed as the Lamoille Valley Rail Road Company (LVRR).

In 2002 the Vermont General Assembly authorized the State to enter into a long-term lease with a USER for the State owned railroad line beginning in the Town of St. Johnsbury in the east and ending in the Town of Swanton (the Line) in the west. In 2003 the General Assembly of the State of Vermont directed that the state-owned railroad corridor between St. Johnsbury and Swanton should be converted to a year-round, multi-use recreation ATF managed by the Vermont Association of Snow Travelers, Inc. (VAST); and the Line was to be rail-banked and used for interim trail use.

The adoption of a long-term lease and the acceptance of this management plan by both the State of Vermont, Agency of Transportation and VAST will govern the management and usage of the Line as a year-round, multi-use recreation and ATF. The parties have agreed to be legally bound by the terms of the lease between the State of Vermont, Agency of Transportation (Lessee) and VAST (Lessor). The VAST Management Plan for the Lamoille Valley Rail Trail will detail the conversion of LVRR right-of-way and its management to a year-round multi-use facility.

The ultimate responsibility for the conversion of the LVRR railbed, into a year-round multi-use recreation and ATF and its management, will be born by VAST. The VAST Board of Directors has established the Lamoille Valley Rail Trail Committee (the LVRTC) that will be charged with overseeing the planning and funding for the conversion and management of the Lamoille Valley Railroad into a year-round multi-use recreation and ATF. The VAST Board of Directors has adopted Policies for the Committee and it will be the responsibility of the LVRTC to develop an annual Development and Maintenance Plan (DMP). The DMP will be developed based upon the results and recommendations of the engineering assessment and plans development process that will take place, and will determine the overall scope of the work to be accomplished by this

project. The DMP will identify activities new construction, repair, and maintenance that will take place for the ensuing year.

During the Summer of 2007, VAST completed an assessment of the LVRT ROW and was able to establish the condition of the rail bed as well as identifying the scope of work necessary to complete the conversion from rail bed to rail trail. A written assessment, details all of the information collected, details necessary work to be completed, and it contains more than 1,600 photos that document the current condition of the rail bed. This document outlines in extensive detail the present conditions to be found on the ROW, and includes tabulations of culverts, bridges, washouts, problem areas, and encroachments. More importantly, the assessment GPSed the entire length, and linked the Valuation Plan stationing to the GPS datum, making it possible to use the accumulated information for eventual use in trail design and construction, future development plans, and trail maintenance plans.

Also completed as a secondary document, and attached to the assessment, was a recommended construction methodology for a proposed trail alternative, in accordance with the Local Transportation Facilities (LTF) project development guide. Much of the information from this document is also included within this plan.

A portion of the rail bed, located in East Hardwick, was damaged in the summer of 2007 by heavy rainfall that caused a landslide and washout of the rail bed. This gave VAST the opportunity to repair the damage that was created, and in the process it allowed VAST to experiment with alternatives that might be successful in our efforts to convert the rail bed into a four-season trail. It also allowed VAST to develop accurate costs for projecting the total cost of the LVRT. This information is detailed within this report and based on the experimental project it is anticipated that it will cost more than \$6.8 million to complete this project.

This plan further outlines and defines the roles of all parties that will be a part of the LVRT process. The plan also outlines the proposed financial possibilities for both conversion of the rail bed and for its future maintenance.

1.1 Mission and Vision

We envision a rural facility that will provide an environment so all users can enjoy nature and the scenic Vermont landscape to its fullest. This environment away from vehicular traffic will become an inviting place where the elderly and persons with disabilities can enjoy more leisurely endeavors and bicycle riders can set their own pace with short rides or multi-day trips. Users will fall into two categories; (1) local users who live within a short distance and will use the ATF on a regular basis; (2) out-of-town and out-of-state users who will commute to a selected location and enjoy their own preferred form of recreation. It is this second category, with the proper promotion, that will provide the positive economic impact to the communities. To varying degrees all user groups will require new dining, lodging and repair businesses to be established to fill the need. The National Rails to Trails Conservancy estimates that a 95-mile rural scenic rail trail in Vermont, after 10 years of proper promotion, should conservatively have

250,000 users per year. These user numbers will drive the economic growth at the local level and provide increased tax dollars at the state level.

The mission of VAST and the LVRTC is to produce and maintain a premier year-round multi-use recreation and ATF that will have national and international recognition as one of the finest Rail-Trails in the US and Canada. We envision a rural ATF that will allow all users to enjoy the natural, scenic Vermont landscape to its fullest.

2.0 LVRT Purpose & Need Statement

PROJECT DESCRIPTION:

The Lamoille Valley Rail Trail (LVRT), project Swanton-St. Johnsbury STP LVRT (1), will be a year-round shared-use recreation and alternative transportation path/trail. The proposed path/trail will be 93 miles in length and traverse an east west 'Cross-Vermont' route across northern Vermont from the village of St. Johnsbury to the town of Swanton. The LVRT will be located on the premises and right-of-way of the former St. Johnsbury and Lake Champlain Rail Road Company (SJ&LC). The SJ&LC was primarily a single-track railroad with a typical right-of-way width of at least 66 feet. In areas of cuts and fills the right-of-way is wider. The easterly terminus is in an industrial area on the south side of the Village of St. Johnsbury (elevation 600 feet) that is located in the Passumpsic River Valley. From St. Johnsbury the line climbs westward through hilly rural country. The line gains elevation for about 28 miles until Greensboro Bend (elevation 1,700 feet) where it crosses the Green Mountain range, passing from the watershed of the Connecticut River to that of Lake Champlain and the St. Lawrence River. Just west of Greensboro Bend the line begins to descend along the westward flowing Lamoille River, which it follows westerly for the next 36 miles to Cambridge Junction (elevation 462 feet). Just west of Cambridge Junction the line turns in a northwesterly direction proceeding across rolling countryside a distance of about 20 miles to Sheldon Junction (elevation 347 feet). At Sheldon Junction, the line begins to follow the westward-flowing Missisquoi River, along which the line continues another 12 miles to its westerly terminus at Swanton (elevation 157 feet) near Lake Champlain. The LVRT will be a predominantly rural trail, separate from automobile traffic except at highway crossings, for bicyclists, hikers, snowmobiles and other users. The LVRT must be in compliance with applicable FHWA standards, including those for ADA, therefore it is logical to build it on the track bed of a former railroad, which has a maximum grade of 2%. The majority of the completed trail will have a compacted gravel surface, not a paved asphalt surface. More than forty trailhead locations were identified along the trail corridor and the majority of those sites would be accessible to persons with disabilities.

HISTORY:

The St. Johnsbury and Lake Champlain Rail Road Company was established on June 30, 1916. In 1972 the SJ&LC petitioned the former Interstate Commerce Commission for authority to

abandon the entire line. The State of Vermont acquired the railroad on December 7, 1973 and the Lamoille Valley Rail Road Company (LVRR) most recently managed the line under lease. Over the intervening years operations waned and ceased in August 1995 as a result of flood damage.

In 1993 the Vermont Legislature recognized the importance of recreational resources for the health, welfare and economic benefit of the State and its citizens and passed legislation that created the “Vermont Trails System”. Chapter 20 of Title 10 commences with the following statement of purpose: *“In order to provide access to the use and enjoyment of the outdoor areas of Vermont, to conserve and use the natural resources of this state for healthful and recreational purposes, and to provide transportation from one place to another, it is declared to be the policy of this state to provide the means for maintaining and improving a network of trails to be known as the "Vermont trails system. It is the intent of the legislature that trails be established within and without boundaries of state parks and forests and, when feasible, to interconnect units of the state park and forest system, as well as such federal and municipal lands as may be appropriate. The development, operation, and maintenance of the Vermont trails system is declared to be a public purpose and in this context, the agency of natural resources together with other governmental agencies is authorized to spend public funds for such purposes and to accept gifts and grants of funds, property, or property rights from public or private sources to be used for such purposes where permission is granted. It is the intent of the legislature to maintain Vermont's eligibility for receiving and spending federal funds for trails. It is the intent of the legislature that whenever a railroad line not already owned by the state of Vermont is proposed for abandonment, and continuation of railroad service is not economically feasible under present conditions, the right-of-way may be acquired by the state of Vermont for railbanking and interim trail use under chapter 58 of Title 5.”*

On June 21, 2002 the Vermont General Assembly authorized the Vermont Agency of Transportation to enter into a long-term lease with Vermont Association of Snow Travelers, Inc. (VAST) for the State owned railroad line between the City of St Johnsbury and the Town of Swanton for the purpose of creating a year-round, multi-use recreation trail. To expedite that prior action, effective June 04, 2003, the Vermont General Assembly directed that the State owned railroad corridor between St. Johnsbury and Swanton should be converted into a year-round, multi-use recreation path and that the Line be rail-banked, and is to be used for interim trail use in accordance with authorization from the federal Surface Transportation Board (STB) based on its ultimate action issued on STB Docket No. AB-444 (Sub-No, 1X) [*Lamoille Valley R.R. Co. – Abandonment and Discontinuance of Trackage Rights Exemption – In Caledonia, Washington, Orleans, Lamoille and Franklin Counties, VT*] (served February 13, 2004). The above Legislative and STB actions set the stage for the creation of “*The Lamoille Valley Rail Trail (LVRT)*.”

On July 31, 2005 the Vermont Department of Forests, Parks and Recreation published its Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2005-2009. The SCORP identified the important role that outdoor recreation provides in support of the health, vitality and well being of Vermonters as well as the benefits that recreational resources provide to Vermont’s Economy. Chapter IV “Vermont Trails and Greenways Plan” of the 2005-2009 SCORP identifies retired railbeds, shared-use paths and rail-trails as important resources for providing recreational opportunities for Vermonters and visitors to the state, Chapter 4 specifically

identifies accomplishments of VTrans and VANR in establishing existing rail-trail systems and the availability of up to 150 miles of additional retired railbed that might provide opportunities for shared-use.

In January 2008 the Vermont Agency of Transportation published its third “Vermont Pedestrian and Bicycle Policy Plan” (VPBPP) The VPBPP is a five year plan and contains the following vision statement: *“The State of Vermont has safe, convenient and accessible conditions for bicyclists and pedestrians of all ages and abilities. Bicycle, pedestrian and roadway networks provide mobility and links with other transportation modes, while complementing Vermont’s natural environment, community character, and overall quality of life.”* The goals of the VPBPP are to enhance and improve Vermont’s pedestrian and bicycle system in support of: enhanced Cultural Environment; enhanced Economic Vitality; improved Health; improved Natural Environment; improved Safety and enhanced Transportation Choice.

PURPOSE:

The purpose of the LVRT is:

- 1) to provide a year-round, shared-use, recreation and alternative transportation path/trail between the City of St. Johnsbury and the Town of Swanton, located on the premises and right-of-way of the former Lamoille Valley Rail Road;
- 2) allow widespread access promoting the types of recreation identified in Chapter IV of Vermont’s Statewide Comprehensive Outdoor Recreation Plan (SCORP);
- 3) promote accomplishment of the goals of the State of Vermont outlined in the “Vermont Pedestrian and Bicycle Policy Plan” (VPBPP);
- 4) provide an east-west connecting corridor for adjoining communities to plan and build their own connecting trail systems or to connect their existing trails to this ‘Northern, Cross-Vermont Trail’, including the following north-south trails:
 - A) planned community recreation paths in St. Johnsbury, Morrisville, Johnson, Jeffersonville and Swanton, which will provide access to and from the villages, and the LVRT;
 - B) the Missisquoi Valley Rail Trail from St Albans to Richford which will connect in Sheldon Jct. and provide users further rail trail options to the Canadian border;
 - C) the Cambridge Greenway Rail Trail connection, which will provide access to and from the village of Jeffersonville;
 - D) the Long Trail that crosses near Johnson Village will provide access for the hikers to and from the village for services and connections north and south;
 - E) the Catamount Trail that will cross near Hardwick will provide skiers the choice of groomed or ungroomed trails;

F) the VAST statewide snowmobile trail network with 21 connections.

NEED:

The need for the project is based upon the following:

1) The Vermont General Assembly's directive, effective June 01, 1993, recognizing the importance of recreational resources for the health, welfare and economic benefit of the State and its citizens by passing legislation that created the "Vermont Trails System," Chapter 20 of Title 10. Chapter 20 indicates that; "It is the intent of the legislature that whenever a railroad line not already owned by the state of Vermont is proposed for abandonment, and continuation of railroad service is not economically feasible under present conditions, the right-of-way may be acquired by the state of Vermont for railbanking and interim trail use."

2) The Vermont General Assembly's authorization to the Vermont Agency of Transportation, effective June 21, 2002, to enter into a long-term lease with the Vermont Association of Snow Travelers, Inc. (VAST) for use of the State owned railroad line between the village of St. Johnsbury and the town of Swanton for the purpose of creating a year-round, multi-use recreation trail.

3) The Vermont General Assembly's directive, effective June 04, 2003, that the State owned railroad corridor between St. Johnsbury and Swanton should be converted into a year-round, multi-use recreation path and that the Line be rail-banked, and used for interim trail use

4) The goals identified in: the Vermont Department of Forests, Parks and Recreation's Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2005-2009; and in the Vermont Agency of Transportation's 2008 five year "Vermont Pedestrian and Bicycle Policy Plan".

2.1 Additional History and Definition

In 2006 the Vermont Legislature passed additional legislation related to the operation and development of the LVRT. Section 271d. of the 2006 Transportation Bill, entitled "Lamoille Valley Rail Trail" established that the State of Vermont would accept the federal earmark for the LVRT and authorized the project to proceed. The language also indicated as follows:

a) The federal earmark for development of the rail banked Lamoille Valley rail corridor recreational trail shall be classified and administered by the agency of transportation as an enhancement project under 23 U.S.C. § 101 (a)(35) subject to terms and conditions of that classification

(1) In-kind services and donations, including credit for volunteer labor, equipment, and operator time donated by private individuals, nonprofit organizations, and governmental entities, shall be allowed and may be used for any match requirements within the FHWA regulations.

- (2) Contractors that are not on the VTrans pre-approved list, but are judged to be a responsible bidder under FHWA guidelines shall be eligible for project related work.
- (3) Project funds may be used on construction, reconstruction, restoration, and maintenance on the trails as authorized by FHWA.

The passage of this legislation is significant to the LVRT as it allows a much greater amount of latitude for what can be allowed as an in-kind match and/or for donated services and materials.¹

The execution of the long-term lease and the acceptance of this management plan by the State of Vermont, Agency of Transportation and VAST will govern the management and usage of the Line as a year-round, multi-use recreation and ATF. The lease also describes and details the responsibilities of the State and VAST relative to the future use and management of the LVRT. A copy of the lease is attached to this Management Plan and becomes a part of it as “Exhibit A.”

The ultimate responsibility for the conversion of the LVRR rail bed, into a year-round multi-use recreation and ATF and its management, will be born by VAST. The VAST Board of Directors has established the Lamoille Valley Rail Trail Committee (LVRTC) that will be charged with the day-to-day conversion and management activities of the project.

3.0 Development of Partnerships and the Management Plan

VAST has been actively pursuing partnerships that will ensure the success of the LVRT. Partnerships have been formed with the three regional planning commissions that are impacted by this project and The Friends of the Lamoille Valley Rail Trail. The LVRT Management Plan calls for the establishment of the Lamoille Valley Rail Trail Advisory Committee (LAC). The LAC will be made up of representatives from the regional planning commissions, municipalities, business owner’s representation as well as representation from adjacent landowners. The LAC will also have representation on the LVRTC. In addition, VAST has reached out to groups like the Vermont Musers Association, Lamoille Valley Anglers and the Vermont Bicycle and Pedestrian Coalition, etc. VAST will continue to reach out to these and other interest groups to request input to ensure that the LVRT is a success.

The LVRT Management Plan is a requirement of the lease between VAST and VTrans and it will be the document that will guide VAST in the development and management of the LVRT. VAST has been working on developing this Management Plan since the date that it responded to the request for RFPs for the future use of the Lamoille Rail Road Corridor. During the development of the plan VAST attended a series of meetings with VTrans and the Regional

¹ It must be noted that even though the Vermont Legislature has passed this legislation FHWA has ruled that the project is one that is funded by Congressional High Priority Funds and that rules applying to these funds will apply. It is not immediately known if there will be a significant impact on the project due to this ruling.

Planning Commissions to work out the finer details of the plan. In addition, each of the three Regional Planning Commissions held public informational meetings that allowed the public to voice their support or concerns over the LVRT. The public's concerns are reflected in this Management Plan. The general public will have additional opportunities to review the Management Plan and to make comments about the plan's future content. The public will be able to view the LVRT Management Plan on the LVRTC website (www.lvrt.org) and they will be able to make comments, via e-mail, to the LVRTC from that site. In addition, the public will have the opportunity to review and comment on Management Plan amendments every two-years from the original adoption date of the plan and/or as otherwise required by the lease.

The LVRT Project Manager has assembled an assessment of the 93.2 miles of rail bed. This assessment serves as the basis for this LVRT Management Plan. The results of the assessment have been used as the basis a series of six public informational meeting that have been conducted by the LVRT Project Engineer/Manager. Three of these meeting were held to inform the Friends of the LVRT and three were held in conjunction with the three regional planning commissions, and their Transportation Advisory Committees (TACs).

3.1 Public Involvement

Public involvement will be welcome and sought throughout the facility conversion process. The first major opportunity will be in the summer of 2008 as the public will be able to comment on the revised LVRT Management, Development and Maintenance Plan. There will be public hearings, as required, during the categorical exclusion process as well as at other various stages of the project to seek input on specific projects, management, maintenance activities, etc. There will also be a website for the facility that will allow for comments to be submitted from anyone accessing the site. We will be looking for constructive comments as well as positive feedback on the project. Since November 2007, six public informational meeting have been held to better inform the public about the future of the LVRT, the Friends of the LVRT and three by the regional planning commissions hosted three of those meetings. The LVRTC sent letters to all adjoining landowners requesting feed back about the trail as well as collecting additional information about those landowners.

4.0 Governance Structure

The VAST Board of Directors shall have oversight responsibility for the LVRT. The Lamoille Valley Recreational Trail Committee shall be formed to oversee planning and funding for the conversion and management of this railbed to a year-round multi use recreation and ATF.

4.1 Lamoille Valley Rail Trail Committee (LVRTC)

The Purpose of the Lamoille Valley Rail Trail Committee; hereinafter, referred to as the LVRTC, shall be to oversee the planning and funding for the conversion and management of the Lamoille Valley Railroad into a year-round multi-use recreation and ATF serving the needs of those who recreate in Vermont as well as the communities and their residents. The LVRTC shall include representation from the motorized and non-motorized users. It shall further be the responsibility of the LVRTC to develop and implement the DMP for the purpose of overseeing the year-to-year maintenance, and facilitating the day-to-day management as well as developing a policy for resolving issues and conflicts as they arise. The LVRTC shall also establish and update a five-year “General Maintenance Plan” that details annual maintenance of the LVRTC and its associated costs and it is to be included within the annual DMP.

A. LVRTC Authority

The authority of the LVRTC shall be as directed by the Vermont Association of Snow Travelers, Inc. (VAST) Board of Directors and shall not exceed the authority necessary to complete the stated purpose(s) of the LVRTC and/or exceed the authority of the VAST policies and By-Laws. The LVRTC shall have the authority to develop and implement plans and policies of the LVRTC, including, but not limited to the following duties:

- Solicit members from user groups and/or other interested parties.
- Develop operation and management plans, and conflict resolution procedures.
- Obtain through all possible sources the funding necessary to cover the costs of planning, permitting, construction, and maintenance of the LVRT.
- Oversee the conversion of the rail-bed into a four-season recreation and ATF.
- Ongoing management of the trail; and planning, funding and implementation of necessary promotional activities, and events, including the production of publications, brochures, events, etcetera.
- Hire a paid Technical Assistant and Project Manager/Engineer to handle the technical, financial and business aspects of the LVRTC if financially viable, and approved by the VAST Board of Directors and included within VAST’s fiscal year budget. It shall be, in part, the duty of the Technical Assistant to perform the following functions:
 - Technical and administrative support to the LVRTC Project Manager/Engineer and LVRTC Fiscal Officer.
 - Assist the LVRTC Secretary to provide records of all meeting and provide support for all communication items and issues of the LVRTC.
 - Establish and maintain a database for issues and complaints.

- Establish and maintain a secure database of LVRT adjoining landowners, initial landowner information shall be provided by LAC members.²
- Work with LVRTC sub-committees and provide technical support and necessary information for members to make informed decisions.
- Assist LVRTC members and staff, as well as VAST staff, to keep communication, statistical and financial records for the LVRT project.

Both the Project Manager/Engineer and the Technical Assistant will be employees of the Vermont Association of Snow Travelers, Inc and covered by all applicable rules, regulations and policies.

- Coordinate with private landowners the location of and installation of “No Trespassing” signage. The signs are to be installed within the trail right-of-way, adjacent to the private landowners property and facing the trail. Signs and installation, of the signs, will be by the LVRTC or by one of the user groups if so designated by the LVRTC.

Prior to the implementation of any of the above, the VAST Board of Directors shall approve said plan and policies.

B. LVRTC Membership

The LVRTC shall be made up of volunteer members representing both motorized and non-motorized recreational activities. Volunteers serving on the LVRTC shall not be paid for their services; however, they will be asked to document their time spent on this committee to potentially be used as match for any federal grants. LVRTC members will be paid mileage, at the appropriate IRS designated rate, for their attendance at all meetings of the LVRTC. The expertise needed from volunteers on this committee may change over time as the conversion is completed and the emphasis changes to one of trail enhancement, management and promotion. All members shall serve annual terms.

1. The LVRTC shall consist of no more than eleven (11) volunteer members. The makeup of the LVRTC shall be as follows:
2.
 - The VAST Board of Directors shall appoint five (5) members to the Committee annually, one shall be a representative of the Vermont ATV Sportsman’s Association (VASA),³ and a second member shall represent adjoining landowners. The VAST Board

² Information within this database that was secured through access to public documents and files shall be made available to the public. All information collected through individual contact shall remain confidential and shall not be shared.

³ VASA will continue to hold its seat on the Lamoille Valley Rail Trail Committee (LVRTC) even though the use of ATVs is currently not allowed. ATV use on the trail continues to be a high visibility problem and VASA’s input to help reduce illegal operation and to coordinate law enforcement is needed.

of Directors shall be responsible for appointing the initial Adjoining Landowner member to the LVRTC, and subsequent appointments shall be recommended by the LVRTC. The LVRTC will request interested adjoining landowners to submit a letter of interest for serving on the LVRTC annually, this request shall be made in July. The letter will ask the individual to express why they have an interest for serving on the LVRTC and what they feel their qualifications are, as well as detailing what valuable attributes they will bring to the LVRTC. Based on letters of interest, the LVRTC shall recommend to the VAST Board of Directors the name of the adjoining landowner who they feel is best qualified for this position. The VAST Board of Directors shall ratify the LVRTC recommendation annually, at their October meeting, or they may ask the LVRTC to submit a different name.

- Five (5)-members of the LVRTC shall be appointed annually from a list of potential members representing non-motorized users who have been nominated by their respective recreation user group to serve on the LVRTC. The Regional Planning Commissions (RPCs) and the “Friends of the LVRT” will assist in reaching out to the various user groups and will make recommendations to the LVRTC on potential candidates to represent trail user groups. Each nominee shall complete an application that will be reviewed by current LVRTC members. If more names are nominated than there are positions to fill, the positions shall be filled by election by ballot. Only the current members of the LVRTC, including those that are in the positions being decided for appointment, will be eligible to cast a ballot. If there were five (5) seats open and seven (7) candidates are nominated, to fill the vacancies, each voting LVRTC member would vote for five (5) of the candidates and the five (5) candidates receiving the most ballots would be elected to fill the vacant LVRTC positions.
- One (1) LVRTC member shall be the Chair, or other appointed individual, representing the Lamoille Valley Recreational Trail Advisory Committee (LAC). The LAC, representing Municipalities; Adjacent Landowners; Regional Planning Commissions; Regional Business Owners; VAST and the Vermont Agency of Transportation, shall select by majority vote, this individual on an annual basis.
- All members shall be elected or appointed at least one month prior to the annual meeting of the LVRTC.
- A slate of Members and Officers shall be submitted to the VAST Board of Directors for the ensuing year, one (1) month after their Annual Meeting.
- The VAST Executive Director shall act as an advisor and a resource to the LVRTC, but will not serve as a LVRTC member and shall not have a vote.
- The VAST Board of Directors will appoint the Chair of the LVRTC from amongst the duly appointed and elected LVRTC membership. _

In the event that any member of the LVRTC sustains three consecutive absences the LVRTC shall contact the absent member and determine whether there is continued interest in serving on the LVRTC. If not, the LVRTC may deem the member to have resigned and shall proceed to take steps to replace that member. Members shall be replaced using the criteria specified in section “B” above. The term of all LVRTC members shall be for one (1) year, but there shall be no maximum number of terms that can be served.

C. LVRTC Officers

The officers of the LVRTC (Executive Board) shall be the Chair, Vice-Chair, Secretary and Finance Officer.

1. The duties of the officers are as follows:

- **Chair** - The Chair shall preside at all meetings of the LVRTC and Executive Board. The Chair shall be an ex-officio member of all subcommittees of the LVRTC. The Chair shall have the usual powers of supervision and management, as they pertain to the office of Chair, and perform such other functions as may be designated by the LVRTC or Executive Board. If one has been established, the LVRTC may designate the Executive Board to finalize negotiations for contracts. The Chair shall recommend to the VAST Board of Directors that they approve and sign contracts upon approval of the LVRTC. The VAST Board of Directors shall appoint the LVRTC Chair.
- **Vice Chair** - The Vice-Chair shall, in the event of absence, disability, or death of the Chair, possess all the powers and perform all the duties of the office of Chair, until such time as the VAST Board of Directors has named an individual to fill the vacancy. The Vice-Chair shall also perform such duties as the Chair may designate. The Vice-Chair shall be an appointed member of the LVRTC and he/she shall be selected by the LVRTC.
- **Secretary** - The Secretary shall keep minutes of all meetings of the organization, or shall designate a minute keeper. The Secretary shall notify members of regular meetings ten-days in advance and special meetings at least 24-hours in advance. The notice shall include the time, place, and general nature of the business to be transacted. All requirements for meeting notice for public meetings shall be followed. The secretary shall perform other incidental functions as necessary. The Secretary shall be an appointed member of the LVRTC and he/she shall be selected by the LVRTC.
- **Financial Officer** - The FO shall be an appointed member of the LVRTC and he/she shall be selected by the LVRTC; however, once selected, the VAST Board of Directors shall approve and ratify the selection of the FO. The FO will work with the LVRTC membership, LVRT Project Manager and VAST Staff and Treasurer to ensure that all of the funding for the LVRTC is in place, and to ensure that all of the proper project documentation is in place that will satisfy FHWA and VTrans when submittals for reimbursement for completed work are filed.

D. LVRTC Subcommittees

The LVRTC may appoint subcommittees, as it deems appropriate.

E. LVRTC Executive Board

The LVRTC may appoint an Executive Board, consisting of its Officers, to carry out the work of the LVRTC between regular and special meetings of the LVRTC.

F. LVRTC Meetings

- **Regular** - The LVRTC shall meet monthly.
- **Special** - Special meetings of the LVRTC or Executive Board may be called at any time by the Chair, or by petition of at least five members of the LVRTC.
- **Meeting Notice** - The Secretary shall notify members of regular meetings ten-days in advance and special meetings at least 24 hours in advance. The notice shall include the time, place, and general nature of the business to be transacted. All requirements for meeting notice for public meetings shall be followed.
- **Annual Meeting** - The annual meeting of the LVRTC shall be held in September of each year.

G. LVRTC Quorum

A quorum for a LVRTC meeting shall consist of a majority of the members, one of which shall be the Chair or Vice-Chair.

H. Amendments to Management Plan

The VAST Board of Directors shall approve the Management Plan and any subsequent changes made to it. Changes may be proposed by a two-thirds majority of those members voting on proposals of amendments at a duly notified meeting of the LVRTC. Such proposals for amendments shall be set forth in the notice of the meeting and changes to the amendment dealing with the same subject matter may be proposed from the floor. All approved changes shall be submitted to VTrans for approval as an attachment to this document.

I. Rules of Order

Business shall be conducted in accordance with the most recent edition of the “Roberts Rules of Order.”

J. Fiscal Year

The Fiscal Year of the LVRTC shall be the same as that of VAST, October 01 to September 30 of the next year. The LVRTC shall be responsible for developing an annual budget for the LVRTC. The proposed budget shall be capable of supporting the work and maintenance plans

necessary for the next fiscal year. The budget shall include the funding source(s) that will be used to accomplish the work as outlined in the annual DMP. The proposed budget shall be presented to the VAST Board of Directors, for approval, no later than May 15, preceding the start of the new fiscal year.

4.2 LVRTC Advisory Committee (LAC)

The participating Regional Planning Commissions shall organize the LAC as a stand-alone committee governed by its own articles of association and by-laws. The LAC shall develop their by-laws, which shall be approved by the LVRTC and VAST Board of Directors. This committee shall work on consensus discussions and make recommendations to the LVRTC. Its sole purpose shall be to advise the LVRTC on issues relating to trail management, promotion, user conflicts, town issues, adjoining landowner issues, as well as other issues that may require LAC input.

A. Membership

Membership of the LAC should be oriented toward municipal, adjacent landowners, and regional representation. State agencies should be considered as technical resources and participate in the LAC discussions as needed. Membership for the LAC shall be as follows:

- (3) three Municipal representatives: one selected by each of the three RPC regions.
- (3) three adjacent landowner representatives: one selected by each of the three RPC regions
- (3) three Regional planning commission staff representatives: one from each of the three RPCs
- (3) three Business owners: one from each region, as identified by Chambers of Commerce and/or Development Corporations
- (1) one VAST member appointed by the VAST Board of Directors
- (1) one VTrans member

The LAC will rely upon the following agencies as technical resources used in forming their recommendations, to the LVRTC, for the implementation and management of the trail:

- Technical Resources
- Regional Development Corporations
- Regional Chambers of Commerce
- Department of Public Safety (Recreation Enforcement)

- Department of Economic Development
- Department of Tourism and Marketing
- Department of Forests, Parks, and Recreation
- Agency of Agriculture, Food & Marketing
- Department of Housing and Community Affairs
- Other agencies as necessary

The LAC shall elect a Chair, Vice-Chair and any other officers as needed. The LAC shall elect one of its members to serve on the LVRTC as the LAC Representative.

The RPCs will assist with the solicitation of municipal representatives and adjacent landowners, to represent their respective regions, by convening meetings for these two constituency groups. RPCs will also work with their respective Chambers of Commerce to identify members of the business community to serve on the LAC.

5.0 Trail Uses

We envision a rural rail trail facility which will provide an environment so all users can enjoy the recreational benefits, nature, and the scenic Vermont landscape to its fullest. Recreation activities like the following will take place: Walking; Hiking; Biking; Equestrian; Cross country Skiing; Dog Sledding; Sleigh Rides; Snowmobiling and many other compatible forms of recreation including competitive events for the preceding uses. The State of Vermont shall decide on any ATV use on the trail on a case by case basis through a public decision making process that includes public hearings conducted by the State; guided by pending policy and standards to be developed by the STATE that comply with federal statutes, regulations and guidance, governing transportation enhancement activities and pedestrian and bicycle accommodations on federal-aid projects.

This environment away from vehicular traffic will become an inviting place where the elderly and persons with disabilities can enjoy more leisurely endeavors and bicycle riders can set their own pace with short rides or multi-day trips.

Users will fall into two categories; (1) local users who live within a short distance and will use the trail on a regular basis; (2) out-of-town and out-of-state users who will commute to a selected location and enjoy their own preferred form of recreation.

The second category, with the proper promotion, will provide the greatest economic impact to the communities. To varying degrees all users will require dining, lodging and repair businesses

to accommodate their needs. This will benefit existing businesses and potentially help with the development of new businesses within each of the regions.

VAST may authorize or issue non-renewable permits for special events which do not exceed 10 days and are recreational in nature or that facilitate temporary agricultural access, not to exceed 10 days duration, to adjoining and adjacent lands for agricultural purposes. VAST shall consult with and coordinate all special use permits with the VTrans. VT statutes annotated under Chapter 60 §3431 of Title 5, “Aeronautics and Surface Transportation Generally” covers agricultural access, to railbanked railroad rights-of-ways.⁴ Competitive events and commercial use of the trail shall require additional coordination with VAST. A special use permit may be required.

6.0 Connectivity

1. Trail Systems

The LVRT will accomplish two very important functions. First, it will act as a starting point for the communities to plan and build their own trail systems. These community systems will provide the economic growth by connecting the rail/trail with the business district. Secondly, an east-west trail provides the linkage connecting the following north-south trails:

- Planned community recreation paths in St. Johnsbury, Morrisville, Johnson, Jeffersonville and Swanton will provide the access into the villages from the rail/trail.
- Missisquoi Valley Rail Trail from St Albans to Richford will connect in Sheldon Jct. and give the users further rail trail options.
- Cambridge Greenway Rail Trail connection will provide access into the village of Jeffersonville.
- Long Trail that crosses near Johnson village will provide access for the hikers into the village for services.

⁴ Notwithstanding the provisions of section 213 of Title 1, when railroad operations cease on railroad rights-of-way owned by the state or municipality, the title or interest held by the state or municipality in such rights-of-way shall be retained by the state or municipality for future transportation purposes and such other purposes as are not inconsistent with future transportation purposes; except that such rights-of-way shall not be used by members of the general public without permission of the state or municipality. *The state or municipality shall allow abutting farm operations to use the land over which the rights-of-way pass for agricultural purposes.* Unless use and occupancy of railroad rights-of-way adversely affect railroad safety, broadband facilities and wireless and other telecommunications facilities that are installed along or within the railroad right-of-way in compliance with applicable operations and safety standards at the time of installation are consistent with existing and future transportation purposes. (Added 1981, No. 187 (Adj. Sess.), § 1; amended 2007, No. 79, § 8, eff. June 9, 2007.)

- The Catamount Trail that crosses near Hardwick will provide skiers the choice of groomed or ungroomed trails.
- VAST snowmobile trail network with 21 connections.

These trail systems will expand the trail options available and enhance the recreational user's opportunities and enjoyment.

2. Excursion Rail

Presently there is only one operating tourist train that could affect trail users. The Fairbanks Scenic Train rail heads in the village of St. Johnsbury and could be accessed from the Three Rivers Bike Path. This train runs a limited schedule.

3. Passenger Rail

There is no regular passenger train service that connects with the portion of the corridor being addressed in this proposal. Future Amtrak connection in Swanton may be possible but would depend on what the town of Swanton has planned for the segment of the corridor that has already been approved for their use.

5. Public Transportation Routes

The Lamoille County Hub & Spoke Passenger Transit Service provides weekday "hub" service in Morrisville, and "spokes" of service extending out to most of Lamoille County's communities and beyond. The service connects with the Oxbow Recreation Path where it meets the LVRR corridor. The Stowe Mountain Trolley runs the Morrisville Shopper bus service between Stowe and Morrisville Tuesday and Thursday, meeting the LVRR corridor near the Senior Center Shop.

6. Park and Ride

There are currently several park and ride lots adjacent to the LVRR corridor, including one in Cambridge near the Deerrun Motor Inn. VAST will work with VTrans to address issues related to the use of STATE owned park and ride lots. (RPCs to Update this Information)

7.0 Compatible Multi-Use

Plans from the beginning have been to build a rail/trail facility that would be available for multi-use recreation activities. The committee comprised of representatives from various user groups or interested individuals from along the corridor will manage the development of this trail to be sure all user groups collaborate on the project. By having user group experts available the final product will be a user-friendly trail for everyone.

Major user groups will work with the LVRTC on this conversion project such as; the Vermont Trails and Greenways Council, Green Mountain Club, VT Mountain Bike Assoc., VT Horse

Council, bicycle tour groups (2), Friends of the LVRT, Vermont Musers Association, Vermont Bicycle & Pedestrian Coalition and the Lamoille River Anglers.

Municipalities that the trail passes through will also be included as the LVRTC works with them to resolve concerns and/or to incorporate their local path plans, and local ordinances, with the plans of the LVRTC. When a higher grade of path, such as asphalt pavement is desired/preferred, a written agreement will be enacted allowing the municipality to install and maintain that surface as long as the overall multi-use plans are not adversely affected. A good example is a cooperative undertaking with the Town of St. Johnsbury. The Three Rivers Bike Path includes use of a section of the corridor, and the two facilities would overlap for a distance of approximately 1200 feet. The St. Johnsbury Selectboard has agreed in writing to a cooperative use of their trail. A parallel snowmobile path will be used in the winter and also used in the summer by horses to eliminate possible damage to the asphalt pavement. This form of cooperation will provide the best facility for the benefit and enjoyment of all trail users. The joint use area becomes necessary to accomplish our plans for providing access to the Comfort Inn located on US Rte 5. The hotel's ideal location at the I-91/US5 interchange will provide needed lodging and trail head parking. The motel's owner, Murphy Realty, has offered assistance and the District Transportation Administrator has reviewed, and approved, a trail route within the US Rte 5 Right-of-Way. On the westerly end, Swanton has plans for a recreation path for their section of rail corridor, and they too are receptive to a similar agreement.

8.0 Hours of Operation

The rail/trail will be open for use 24 hours per day, 7 days per week, 52 weeks per year, without any planned restrictions except as noted below:

- a) walking/hiking/jogging - unrestricted year round use, except as noted in section i) below.
- b) Americans with Disabilities Act (ADA) accessibility - restricted by trail condition, suitable hardened surface for wheel chair use from approximately May to November. Winter time use is allowed, but would be difficult.
- c) bicycles - year round, mostly in late spring through the fall season. Winter biking on snowmobile trails is becoming popular and will be allowed.
- d) horses - to lessen the damage when the trail surface is soft, use will be restricted from March through May as well as other times as dictated by the condition of the ATF surface, and as noted in i) below. Use during the winter months may not be allowed, but would require additional cooperation between users, and approval of the LVRTC.
- e) snowshoe/x-country skiers - unrestricted from first snow to spring thaw.
- f) snowmobile – Snowmobile use will be allowed during the legal Open Season, December 16 through April 15. Operation between the hours of 11:00pm and 6:00

- am will be prohibited. A speed limit of 35 mph will be posted and enforced. Snowmobile trail grooming equipment may operate during the time frame that the trail is closed to snowmobiles.
- g) atv's - not allowed for recreational use. The exceptions will be ATVs used for maintenance during daylight hours May through October, law enforcement and emergency service vehicles, all with appropriate markings and flashing lights.
 - h) motorized wheeled vehicles - not allowed. The exception will be maintenance vehicles, law enforcement and emergency service vehicles with appropriate markings and flashing lights motorized wheelchairs, and when state or local regulations permit, electric bicycles per 23 U.S.C. § 217.
 - i) if necessary, the trail may be closed for its entirety, or certain sections due to floods and other natural events. The trail may also be closed during late fall and early spring to ensure the integrity of the trails surface and to prevent it from being torn up by premature use while the trail is wet.
 - j) nothing in this section shall prohibit a municipality from establishing local ordinances that control legal uses of the LVRT, but in no case shall the ordinance prohibit legal uses.

9.0 Required Facilities

The following facility estimates are based on an anticipated user base of 10,000 persons in the first year following completion of the trail. Within 5 years it is estimated that the annual total number of trail users will increase significantly.

1. Parking Facilities

There are currently suitable public parking lots in every town along the corridor. More would have to be constructed to keep pace with the increased numbers of users. As the need arises for new parking facilities or expansion of existing facilities, local municipalities will be consulted to determine if a partnership can be developed to meet local needs as well as the LVRT needs. A map of parking lots available to users and their accommodations will be developed and made available in marketing materials and on the website.

2. Path Connectivity

Adequate interface with communities will be provided as the number of local paths and trails is anticipated to increase following the opening of the Lamoille Valley Rail Trail.

3. Trail Enhancements & Amenities:

a) Fishing & Canoeing Access –

82% of the LVRR corridor runs adjacent to the Missisquoi River, Lamoille River and Black Branch Brook. We will work with Trout Unlimited, Northern Forest Canoe Trail and other interested fishing groups, and several canoe touring agencies that currently utilize these waterways utilizing Department of Fish and Wildlife as a Resource Agency.

b) Emergency Telephones –

Arrangements will be made to install signage directing users to telephone access available along the trail for emergency purposes.

c) Benches, Resting & Picnic Areas –

Coordination with local communities and path committees for planning, installation, and maintenance.

d) Signage & Markings –

Warnings for trails and roads, speed limits and other safety related signage will be installed as required by applicable sections of the MUTCD. Later installation will include informational, mile markers and distance signs. Mile markers and their location will be coordinated with VTrans Rail section prior to installation to maintain a single marking system.

e) Access Points -

Access points from local and state road systems, including VT Rte 2, 15, 108 and 78 will be correctly configured and defined in accordance with Vermont Standard Drawing B-71.

f) Recreational Facilities and Sporting Fields –

Will be identified with “where and what” information signs and kiosks.

g) Bike Racks –

Will be added as user density grows

h) Bollards -

Installed as necessary to control unauthorized vehicle access, as the problem becomes troublesome.

i) Information Kiosks –

Posting of information on local amenities will be coordinated with the respective chambers of commerce and recreation and conservation committees.

j) Restored stations or sheds –

Specifications and guidance will be coordinated with local historical societies, State Historic Preservation Officer, and VTrans.

10.0 Economic Impact

The following listing gives the summation of existing entities, which are estimated to be sufficient to support an annual trail user population of up to 75,000. We will be working with Visitor Bureaus, Chambers of Commerce and Economic Development Organizations along the corridor to encourage the establishment of additional businesses and recreational facilities, required to keep pace with the growing user base. We will also coordinate with Historic Preservation groups to accomplish historic site/structure identification, restoration and information awareness signing.

Management, Development, & Maintenance Plan for the Lamoille Valley Rail Trail
 Approved by VAST Board of Directors May 27, 2008

St. Johnsbury	Danville	Walden	Greensboro
9 Restaurants 2 Gas Stations 2 Motels 1 Market 1 Bus Station 1 Pool/Tennis	3 Restaurants 3 Gas Stations 4 Motels 2 Horse Stables 1 Public Beach 1 Health Center	1 Gas Station 1 General Store 1 Picnic Area	1 Gas Station 1 General Store
Hardwick	Wolcott	Morristown	Hyde Park
6 Restaurants 8 Gas Stations 1 Motel 1 Snowmobile Sales	1 Gas Stations 1 Mini Mart 1 Bed & Breakfast 1 Hist. Covered Br. 1 Camp Ground	10 Restaurants 5 Gas Stations 2 Hotels 2 Bike Shops 1 Snowmobile Sales 2 Information Kiosks 1 Museum 1 Horse Stables 3 Conv. Store/Delis 2 Public Phones	1 Restaurant 1 Market 1 Snowmobile Sales
Johnson	Cambridge Jct.	Jeffersonville	East Fairfield
3 Restaurants 3 Gas Stations 1 Canoe Guide Ser. 1 Health Clinic 1 Grocery Store 2 Conv. Store/Delis 1 Fire & Rescue	2 Bed & Breakfasts 1 Hist. Covered Br.	2 Gas Stations 2 Restaurants 2 Bed & Breakfasts 1 Grocery Store 2 Conv. Stores/Delis 1 Fire & Rescue 1 Horse Stable 1 Bicycle Sales	2 Gas Stations 1 Grocery Store 1 Convenience Store 1 Fire & Rescue
East Highgate	Highgate Center	Highgate	Swanton
1 General Store	2 Gas Stations 1 General Store 1 Cafe 1 Fire & Rescue	1 County Airport	3 Restaurants 5 Gas Stations 2 Motels 1 Camp Ground 1 Ice Cream Parlor 2 Grocery Stores 1 Bicycle Shop 1 Fire & Rescue

11.0 Conflict and Dispute Resolution

From time to time user conflicts of the LVRT may develop, as well as conflicts and/or disputes with adjoining landowners. There may also be times when disputes may arise over decisions that have been made over trail maintenance, operation and development. In the eventuality that conflicts and/or disputes do arise the following steps shall be taken to resolve conflicts or disputes that arise:

A. VAST and VTrans

In the event that a dispute between VAST and VTrans arises, the terms spelled out in Article XVII (Dispute Resolution; Exhaustion of Administrative Remedies) of the lease between the parties shall be used to resolve it.

B. All Other Conflicts or Disputes

Step 1 – The aggrieved party shall state their grievance in writing to the Executive Director and President of VAST. The Executive Director and President of VAST shall coordinate with the LVTRC in reviewing the grievance. A written response to the grievance shall be completed within 14 days. If the aggrieved party is not satisfied with the results the process will go to step 2. Notification shall be mailed to VAST/LVRT, 26 VAST Lane/Berlin, Barre VT 05641.

Step 2 – If the aggrieved party is dissatisfied with the ruling of the Executive Director and President of VAST, they may petition the VAST Board of Directors to hold a hearing on the issue. The Board shall hold the hearing within 21 days of receipt of the request and issue their decision within 7 days of the hearing.

Step 3 – If the aggrieved is not satisfied with the VAST Board of Directors' decision they may appeal it to the Vermont Transportation Board under 19 V.S.A. § 5(h), the notice of appeal must be filed with the Secretary within 30 days of the decision from which the appeal is taken. The Secretary shall promptly forward the notice of appeal to the Board, together with the Agency's record of decision.

Step 4 – In accordance with 19 V.S.A. § 5(c), a final order of the Board may be reviewed on the record by the superior court pursuant to Rule 74 of the Vermont Rules of Civil Procedure.

12.0 Citizen Concerns, Requests and Complaints

From time to time citizens may have concerns, requests for information, or complaints about the LVRT. The following procedures will be used to document citizen concerns, requests or complaints, as well as outlining the steps that will be taken to resolve their issues.

The Lamoille Valley Rail Trail Committee (LVRTC) oversees the planning and development of the trail, the LVRTC meets on the second Wednesday of each month at 6:30 PM. The location of these meeting shall be indicated on the LVRT website www.lvrt.org. The LVRTC will provide

the necessary forms for citizens to use to register their complaint, concern, or to facilitate a request. The forms are available from members of the LVRTC, and the Lamoille Valley Rail Trail Advisory Committee (LAC) for distribution and are available through VAST and the LVRTC website. It will be the citizens' responsibility to submit their issues in writing, either mailed or e-mailed, on the appropriate form to:

VAST
26 VAST Lane
Barre, VT 05641
Attn: LVRT Issues
Or email to:
kduprey@vtvast.org

• **Understanding the Process**

Whether a citizen submission is made directly through VAST, the LVRTC or the LAC, it is required that the citizen provide all of the information requested by the complaint form. VAST or the LVRTC will send an acknowledgement of receipt form to the individual filing the complaint within 10 days. The concern, request, or complaint will be entered into the issues database and forwarded to the LVRTC Chair and Trail Issue Sub-Committee for action.

The Trail Issue Subcommittee is made up of 2 LVRTC members and a member of the LAC. The LAC member will rotate based on the county where the submission originated. The Trail Issue Subcommittee will consider the submission and apply one of the following options:

1. Seek additional information from the citizen, if needed;
2. Take action and report to the LVRTC and/or other relevant parties;
3. Seek counsel from other relevant parties and then implement option #2 above;
4. Refer the submission back to the full LVRTC or to another relevant party, if the submission goes beyond the authority of the Trail Issue Subcommittee; or
5. Request an extension for more time to consider your issue and seek resolution.
6. The Chair of the LVRTC is empowered to act on behalf of the Issues Subcommittee, and to respond to the individual if it is felt that this action is warranted, and the subcommittee cannot respond in a timely manner.

Regardless of the option chosen, it is the LVRTC goal to issue a response to the submission within 30 days. The response will include a summary of actions taken, an explanation of the next steps to be taken, and information on who to contact in order for the citizen to follow-up.

• **Conflict Resolution Process**

If a citizen submits a complaint, and they are unsatisfied with the results of this protocol, they may consider pursuing their issue using the Conflict Resolution Process as described within the Section 19.0 of this plan.

• **Process Exhibits**

Appendix “A” in the rear of the Management Plan shows a flowchart that outlines the “LVRT Protocol for Citizens Concerns, Requests, and Complaints.”

Appendix “B” in the rear of the Management Plan is a document that will explain the process to the citizen.

Appendix “C” in the rear of the Management Plan is a copy of the form to be used to register a citizen complaint, request or complaint.

13.0 Law Enforcement

As more and more Vermonters, as well as visitors to Vermont, begin to participate in all forms of recreational activities there arises a need for recreational education and law enforcement. The LVRT will ultimately need a presence of law enforcement both to educate the public as well as to ensure that all Vermont laws are properly and adequately enforced.

Vermont statutes do not grant VAST any law enforcement authority; therefore, the LVRTC and VAST will address public education, signage and public outreach to reduce the number of incidents on the trail that require action by a law enforcement officer. VAST and the LVRTC will cooperate with all Vermont law enforcement agencies in an effort to secure adequate funding for recreational law enforcement for the LVRT.

VAST and their partners through the LVRTC will strive to educate each of their memberships as well as the general public and/or visitors to Vermont of the laws, rules and regulations that govern the use of the trail. This will be done through the development of brochures; outreach to members through various newsletters and publications; signs at entry points to the trail and along the trail; general public outreach and education. The LVRTC will explore the option of creating a volunteer monitoring process for users of the trail. This will allow for “eyes and ears” on the trail at times when law enforcement officers are not available.

VAST has purchased and installed devices that record the time and speed of all snowmobiles that pass over the trail. These devices have been strategically placed at five locations along the trail and they will give us valuable information about the use of the trail; especially, after curfew use as well as the speed of those using the trail. This information will allow us to better inform law enforcement as to when violations are taking place; specifically, if we have a location where it appears that a pattern of misuse is apparent. With this information law enforcement will be able to target special areas during the time frames of misuse. Curfews are the hardest of all laws to enforce and to some extent there will never be 100% adherence; regardless, of the time frame of curfews. It is hoped that the steps that have been taken will work and the information that we are

able to compile will allow law enforcement to more adequately enforce imposed curfews and speed limits on the LVRT.

The issue of sound is one that VAST is trying to address. One of the hardest laws to enforce is the one that pertains to the allowed decibel level of snowmobiles. The Society of Automotive Engineers (SAE) has devised a new standard that allows an effective field test to ensure that all snowmobiles adhere to the legislated decibel level. VAST will introduce legislation that will allow Vermont law enforcement officials to utilize this new test to ensure that all snowmobiles are in compliance with the law. VT law enforcement agencies will be conducting tests using this standard to see how effective it is in the field.

Additional discussions will be taken to the VT General Assembly to look at revenue sources for law enforcement. The cost of enforcement is not one unique to the Lamoille Valley Rail Trail, but one that affects all recreational sports. We hope to complete the legislative session with revenues committed to annual recreational law enforcement.

The following law enforcement agencies shall be the primary sources for law enforcement for the LVRT:

• **Caledonia County – Caledonia County Sheriff**

Sheriff Michael Bergeron
1126 Main Street, Suite 2
St. Johnsbury VT 05819
1-802-748-6666

• **Lamoille County – Lamoille County Sheriff**

Sheriff Roger Marcoux
222 Main Street
PO Box 96
Hyde Park VT 05655-0096
1-802-888-3502

• **Franklin County – Franklin County Sheriff**

Sheriff, Robert Norris
330 Lincoln Avenue
PO Box 367
St. Albans VT 05478-0367
1-802-524-2121

All violations of VT law, including trespass related issues should be reported to the County Sheriff. County Sheriffs will be responsible for investigation and follow up for all complaints and violations of law regarding the LVRT. County Sheriffs will also be responsible for patrols on the LVRT and will be working cooperatively with the VT Department of Fish and Wildlife in an effort to provide these services.

If a caller is unable to contact the Sheriffs' Departments they are to call the VT State Police Dispatcher in their District and advise them that they have a Lamoille Valley Rail Trail issue and ask that the on call VT Fish and Wildlife Warden, for their District/County (Caledonia; Lamoille; Franklin), be advised of and dispatched to investigate the violation of law. The on call Warden will respond to the call or complaint. The telephone numbers for the Regional VT State Police offices are as follows:

• **Caledonia County**
1-802-748-3111

• **Lamoille County**
1-802-878-7111

• **Franklin County**
1-802-524-5993

14.0 Snowmobile Use Relocation Criteria

From time to time there may be instances where an adjoining landowner may ask to have snowmobile use on the LVRT relocated around an occupied dwelling that exists within 100 feet of the LVRT. Requests shall be handled on a case-by-case basis and the following steps and procedures shall be followed:

1. A landowner wishing to relocate snowmobile use away from their existing dwelling shall first notify the Vermont Association of Snow Travelers, Inc. (VAST) in writing of their request. The request shall be mailed to VAST, Attn. LVRT Relocation, 26 VAST Lane, Barre VT 05641. VAST will contact the requesting landowner within 10 workdays, after receipt of the letter, and will provide the landowner with the current construction standards for snowmobile trails entitled "Guide for the Development of Snowmobile Trails. At that time a meeting date will be established, between VAST and the requesting landowner(s), to review the proposed snowmobile trail relocation route. Landowners shall be responsible for the following:
 - a) If there is a cost to relocate the trail around the property, the landowner, making the request, is responsible for the involved cost of the relocation.
 - b) If the relocation of the trail involves crossing property, other than that of the landowner requesting the relocation, the landowner requesting the relocation is responsible for obtaining the necessary permission from all additional landowners over whose property the relocated snowmobile trail will be located.
2. VAST shall inform and consult with local and county snowmobile clubs during the relocation process.

3. If agreement on the relocation cannot be reached, the process established under Section 19 of this Management Plan, "Conflict and Dispute Resolution" should be used to resolve the impasse.

VAST shall draft an agreement between VAST and the landowner(s) describing the necessary work that is to be completed, project cost (if any), and responsibilities. The duration of the agreement shall be annual unless otherwise stated in the agreement. All involved parties shall sign the agreement.

15.0 Restoration of Existing Facilities to Meet Trail Criteria

As recommended in the earlier version of the IMP, VAST and the LVRTC completed an engineering assessment of the LVRT right-of-way (ROW) in April 2008, and copies have been distributed to VTrans, the state's environmental community, many of the trails stakeholders and all the adjoining communities along the line. This document outlines in extensive detail the present conditions to be found on the ROW, and includes tabulations of culverts, bridges, washouts, problem areas, and encroachments. More importantly, the assessment GPSed the entire length, and linked the Valuation Plan stationing to the GPS datum, making it possible to use the accumulated information for eventual use in trail design and construction, future development plans, and trail maintenance plans.

Also completed as a secondary document, and attached to the assessment, was a recommended construction methodology for a proposed trail alternative, in accordance with the Local Transportation Facilities (LTF) project development guide. In a nutshell it recommends constructing the trail on the existing ballasted way, and describes how VAST proposes to renovate and construct the trail. It includes detailed information on topics such as bridge reconstruction and rehabilitation, clearing, repair of ditch systems, culvert repair, trail work in beaver regions, ANR Floodplain Restoration Program sites, and the nature and severity of encroachments.

Probably the most difficult and time consuming problem facing the completion of the trail, other than generating the funding necessary to match the federal funding available, is the resolution of several severe encroachments, including the engineering and environmental problems associated with three farms deposition of septage on the ROW, two gravel pits depositing silt from their operations on the ballasted area, and the Town of Johnson's removal of the ROW embankment and ballasted road bed for approximately 500 feet at the site of the Town Public Works Department. Efforts are underway to involve the Vermont ANR and the Dept. of Agriculture, the NRCS, and VTrans in solutions to these encroachments, which are not the responsibility of VAST or the LVRTC to resolve.

Also included in this alternative document is a recommended construction-phasing plan, and recommendations for trail maintenance. The assessment/alternative is currently being reviewed

by LTF, and VAST is preparing to hire the consultant to begin the next phases of project development: resource identification, identification of other alternatives, and permitting.

It is the intention of this iteration of the MP to follow the recommendations set out in the aforementioned assessment and alternative with respect to the design, construction, and maintenance of the trail.

16.0 Project Funding

It is anticipated that the total cost to rehabilitate and convert the former LVRR railbed into a four-season multi-use and ATF will range between \$6,800,000 and \$7,200,000. Congressman Bernie Sanders has been an ardent supporter of this project for many years, and was successful in obtaining a Federal Transportation earmark in the amount of \$5,800,000+ included within the renewal of the Federal Highway Transportation Bill in the summer of 2005. The re-authorization of the Federal Highway Bill is a part of the Federal funding mechanism for all highway construction and maintenance. The appropriated amount has subsequently been reduced to \$4,900,000+ due to Congressional rescissions during the impacted budget years.

The amount approved by Congress is 20% less than had been hoped for, and due to this fact we will have to raise more than \$2,500,000 to meet our match and to complete the project. The Federal Grant requires that VAST generate a 20% match for the project. This means that the LVRTC will have to raise approximately \$1,225,000 in matching funds to meet grant requirements, this can be spawned as cash, or by other allowed means such as donations, in-kind services and volunteer labor. Based on the above calculations, it will also be necessary to raise an additional \$675,000 minimum, to complete the project, and possibly as much as \$1,175,000, if our projected costs increase. In addition, the LVRTC will be responsible for raising any additional funds that ensure that there will be funding to maintain the trail. The bottom line, we may have to generate as much as \$3,400,000 to ensure completion of the project and to ensure that future funding for maintenance is available.

The LVRTC will work with the involved Planning and Development Councils in an effort to find any and all available options for grants, from private foundations and/or other entities that may have the potential to help achieve the requirement for 20% matching funds for this important project.

They will also have to investigate ways to raise any additional funds needed to complete the project. Other options that will be investigated include Transportation Enhancement Program funds. If interim working capital is required, or if money has to be borrowed, VAST will obtain sources for funding short term and/or long term financing for this project.

The LVRTC has hired a Capital Campaign Manager for the LVRT project. The goal is to raise at least \$2,000,000 of necessary funds through the generosity of the public and the many Charitable Trusts that exist both in Vermont and the northeast region.

17.0 LVRT Engineering Assessment

The purpose of the **Engineering Assessment** was to discover, document, and evaluate existing field conditions of all assets along the entire right-of-way (ROW) with respect to their utilization in, and impact on a proposed shared-use trail project. The purpose of the **Proposed Trail Alternative Description** portion of this document is to provide a project work scope and construction methodology for the trail for use in project permitting, public comment, cost estimation, and eventual project design and construction.

17.1 Brief Railroad History, ROW Characteristics, and Geography:

To appreciate the existing conditions of the ROW, and their impact on the project and its eventual construction, it is useful to review the history and geography of the St. Johnsbury and Lamoille County Railroad (StJ&LC).

After the Civil War, railroad growth in the United States was rampant, and the Transcontinental Railroad would be completed in 1869. Dynamite was invented in 1867, and in that year a group of wealthy businessmen in St. Johnsbury, including scale magnate Horace Fairbanks, decided to build a railroad. Vermont in 1867 was, visually, a different state than now. The sheep-raising period was past its peak, but most of the state had been cleared of trees by that time. The railroad envisioned, would be built through predominately cleared areas, fields, and cropland. The railroad couldn't be justified on the basis of local freight or passenger traffic, but the possibility of becoming part of a "through route" between Portland, ME, and Ogdensburg, NY generated enough local interest to fund the construction of the line. After considerable fiscal difficulty the line between St. Johnsbury and Swanton was completed in 1877.

A short geographical description of the line, written for the Abandonment and Discontinuance Document by VTrans: "The easterly terminus is in an industrial area on the south side of the village of St. Johnsbury (elevation 600 feet) which is located in the Passumpsic River valley. From St. Johnsbury the line climbs westward through hilly rural country. The line gains elevation for about 28 miles until Greensboro Bend (elevation 1,700 feet) where it crosses the Green Mountain range, passing from the watershed of the Connecticut River to that of Lake Champlain and the St. Lawrence River. Just west of Greensboro Bend the line begins to descend along the westward flowing Lamoille River, which it follows westerly for the next 36 miles to Cambridge Junction (elevation 462 feet). Just west of Cambridge Junction the line turns in a northwesterly direction proceeding across rolling countryside a distance of about 20 miles to Sheldon Junction (elevation 347 feet). At Sheldon Junction, the line begins to follow the westward-flowing Missisquoi River, along which the line continues another 12 miles to its westerly terminus at Swanton (elevation 157 feet) near Lake Champlain".

The fiscal difficulties would not go away, and the railroad continued to struggle through a period of time in the country where, for everybody else, rail was king. By about 1920 the only significant upgrades on the line were to bridges, and that marked the end of any substantive work on the line's infrastructure. By 1972 traffic on the line had to travel below 10 mph, and derailments were very common. The state assumed ownership in 1973 and limited attempts were

made to improve the ballast and track but no significant work on drainage or clearing occurred. Most traffic had disappeared by about 1980; the track between Morristown and Swanton became inactive in the '80s and between St. Johnsbury and Morristown in the mid '90's. Track and tie removal occurred in 2005.

The impacts of historic funding problems, and the landscape of Vermont, imprinted several important engineering characteristics on the ROW. Drainage structures- culverts were probably designed for higher flows than are present today because the cleared lands of the mid-1800's shed water at higher rates than the forests of today's landscape. The tight curves, steep grades, and narrow ledge cuts and embankment fills of the railroad, especially the eastern half, were difficult and expensive to operate on, and maintain. Instability present in soils and slopes in some locations where cross-section geometry involved combination cut and fill was minimized or not considered by the designers. Regeneration of forests and the reintroduction of beavers to the state have altered the hydrologic playing field on many stretches of the ROW. The cuts, and some embankments, depending on their makeup, are very narrow, and hardly wide enough for one set of tracks. The ROW never received anything more than light ballast, and, most importantly, was only rarely maintained after 1920. Some tree diameters adjacent to the tracks now exceed 10" and the lateral ditch systems are, in many areas, silted out. Considerable damage to the ditches and the ballast has also occurred since the cessation of train traffic. Grading work done by the track and tie removal contractor, along with the truck traffic necessary to remove the track and ties, pushed ballast into the saturated sub-grade, and the adjacent ditches. Today the majority of the ballasted surface resembles that of a town's Class 4 graveled road, rather than that of a properly ballasted railroad bed. New steel bridges installed between the 1890's and the 1920's were painted with red lead paint primer, and an overcoat of coal-tar paint. This coating system is exceptionally long lasting, but on all the St.J&LC bridges is almost completely worn away to bare steel. Rust on a few of these structures is beginning to pop rivets.

17.2 Baseline References:

To put into perspective what to expect during the LVRT reconnaissance, visits were paid to the Northern Rail Trail in New Hampshire, and the Missisquoi Rail Trail in Vermont. The Northern Rail Trail is under development with some sections completed, and some sections still under construction. The "pre-rail trail" ROW in New Hampshire was in much better condition than the LVRT ROW, and the granite structures and accoutrements were of higher quality. Both cut granite mile markers were present as well as the "latest" generation (probably circa 1950) of such markers made of concrete specifically for the line. Granite culverts were of extremely high quality and signs of older maintenance activities on the structures were clearly evident. Abundant ballast was present, and the cleared way was quite open and easy to walk. The Missisquoi Rail Trail, completed about ten years ago is holding up well, but is showing disturbing signs of a lack of maintenance. The bridges on the line are in good condition and the new bridge across the Missisquoi along with the guard fences at the ends are in excellent condition. However, the gravel surface has largely grown over with grass, albeit mowed, and the ditches have been lost to underbrush. Small trees and saplings are growing out from the sides and the branches protrude into the trail area. Gates and traffic control devices had been installed on both trails at points intersecting town roads and state highways. In all cases, on both trails, the gates were damaged

and broken, and open. New Hampshire representatives indicated they were no longer installing such equipment because of the cost, vandalism, and irrelevancy.

17.3 Existing LVRT Conditions:

In general the survey crew was very successful in finding or confirming the presence of all the features noted on the Val Plans, unlike past Edwards and Kelcey and VTrans investigations that only found about 32% of the culverts, and missed some of the bridges. Further, the condition of some of the bridges was better, and the number and severity of the washouts was less than expected (Many of the minor washouts were repaired as part of the track and tie removal project).

The crew had been warned to look for granite mile markers but none were observed. Most mile markers were found, but consisted either of 1940's-type concrete guard rail posts with a painted mile number or an "Agway" fence post with an aluminum plate bolted to the post with plastic mile lettering. Milepost 40, or what was found at about that location, appears to be granite, but also may be a broken fragment from a larger granite carving that was damaged, and used for embankment "fill". Of note was evidence that something hanging from a past train smashed into many of the mile markers of both types leaving only pieces on the ground. A few whistle posts were also found, but all were made of wood (probably cedar) and are in an advanced state of decay. Some culvert markers were in evidence also. They appear to be sections of 2" iron pipe with one end stamped flat to accept a painted indicator.

Two "historic" structures were noted during the assessment. The first was a section house at station 1824+00. In the entire 93 miles of trail, this was the only identified section house, and its overall condition, fair, made it stand out. It is on the ROW but well off the ballast and would not be influenced by any trail work. The second structure is the "Fisher Bridge", station 2037+16, and its position on the trail is hard to ignore. Some maintenance and repair work is necessary on the western embankment, but the bridge would not be affected by the trail, except for the rails on the deck of the bridge. There may be other structures having significant historic value within the ROW of the StJ&LC Railroad but their physical location is well off the ballast, and they weren't identified.

Another indicator of Vermont's past, old wire fencing, was found almost everywhere, including the middle of remote forests, along the edge of the ROW, generally on the ground, but sometimes in the middle of very old trees. This is a further verification of the activities and landscape present when the railroad was constructed. Several miles of newer, barbwire fencing was also observed in the western reaches of the LVRT. This fencing, placed by abutting farmers, serves to keep their livestock from roaming free. Much of this fence is located at the edge of the ballast, and will have to be moved further away, beyond the lateral ditches, to allow construction and operation of the trail. A small cache of old track was also found in East Hardwick appears to be the original weight rail used to construct the line, perhaps in the 1800's. Further investigation will be needed to confirm the weight and age, and the rail will need to be secured to keep it from being stolen for its scrap value.

17.4 Rail Road Bed Conditions:

Probably the first canon a civil engineer learns is, “A road is only as good as its sub-base, and water is its natural enemy”. Owners and maintainers of the St.J&LC have ignored this dictum for decades, and, barring missing bridges, wet and failed (as in: structurally failed) ballast is the single worst problem of the ROW today. An analysis of the visual data collected on the survey indicates that an average of 16% of the stationing on the line have wet or failed ballast. On the eastern end this percentage is over 25%. The situation in some areas is serious enough that only tracked equipment can likely navigate the ballast surface without getting stuck. Visual inspections usually miss many subsurface problems so the actual amount of ballast unable to support any traffic may be much greater.

As previously stated, this is not a recent problem. Anecdotal evidence in the history of the railroad points to a historic lack of funding for ballast, and to sufficiently grade, drain, compact the ballast and sub-grade. Also, the sub-grade materials exposed in some embankments reveal that the builders used some very unsuitable material in the construction of these works. Recent rail and tie removal activity caused additional damage, although had the roadbed been dry these activities would likely not have been a problem.

Once ballast has been pushed into a wet sub-grade there are no easy or inexpensive solutions for recouping the ballast. The first concern must be to dry the sub-grade, and then re-grade and re-compact the material. To dry the sub-grade, its section must be significantly higher than the bottom of the lateral ditches alongside the ballast.

A more recent threat to the roadbed is the reintroduction of the beaver to Vermont and the damage that is occurring on many sections of the ROW. Of particular note is the seven-mile stretch between the route 109 crossing at Cambridge Junction (station 3394+00) and the ROW crossing of Lost Nation Road in Bakersfield (station 3768+00). Within that area almost entire valley floors have been turned into shallow wetlands in some locations and beaver dams parallel the ballast, sometimes crossing it, for hundreds of feet. Remarkably, bearing capacity hasn't been completely compromised and beaver activity hasn't placed much of the ballasted surface under water.

Appendix “D” of this plan entitled “LVRT Locater” is a table that lists the major attributes of the LVRT within each of the 18-towns thru which the LVRT passes. **Appendix “E”** of this plan, entitled “Master Feature List,” details every bridge, culvert and grade crossing encountered during the assessment of the LVRT.

17.5 Floodplain Restoration Projects:

The Vermont Agency of Natural Resources (ANR) Department of Environmental Conservation (DEC) River Management Program has initiated a series of floodplain restoration projects (FRPs) on the Lamoille River between Hardwick and Sheldon. Their purpose is to return to the river historic areas of floodplain cut off by the construction of the railroad embankments along the river in the late 1800's. The projects collect and store what remains of the stone ballast, remove and lower the railbed embankment along the ROW to adjacent field elevations, and reapply the ballast after the embankment has been removed. Once completed the railbed surface

looks remarkably like a new stretch of constructed railbed, without the overgrown vegetation, or debris on the ballast.

The locations, construction year, and status of each project is listed below:

- Wolcott Prototype: station 2172+04 to 2182+38, completed
- Wolcott Site 1: station 2249+25 to 2264+12, completed
- Johnson Site 1: station 2837+68 to 2860+93, complete
- Cambridge Site 1: station 3196+60 to 3235+06, complete
- Fletcher Site 1: station 3614+40 to 3629+22, complete
- Bakersfield Site 1: station 3711+80 to 3729+03, under construction
- Bakersfield Site 2: station 3756+05 to 3767+42, under construction
- Fairfield Site 1: station 3843+20 to 3857+96, under construction
- Fairfield Site 2: station 3966+70 to 3972+37, 2008
- Fairfield Site 3: station 4003+10 to 4026+50, completed
- Fairfield Site 4: station 4050+70 to 4077+48, completed

Eight other sites have been identified (Hardwick Site 1, Hyde Park Site 1, Johnson Sites 2 and 3, Bakersfield Site 3, and Fairfield Sites 5, 6, and 7) but are not yet funded, and will be accomplished as funding and permitting allow.

17.6 Ditches:

There are three types of ditches present on a railroad. The first of the three are the **cross-ditches**. Their purpose is to carry permanent and intermittent streams across the ROW in conjunction with culverts. They are located at every location water is observed to cross the ROW at the time of construction. Their flows can be almost any amount from a seep to a large brook. The second are the **lateral or side ditches** along the edge of the ballast. Their purpose is to keep the water table well below the ballast and the sub-grade to maintain the sub-grades soil bearing capacity. Normally they are not expected to collect water from crossing streams, only to carry water accumulating near the sub-grade to a nearby cross ditch. Their flows are generally very low and may rise and fall with the local precipitation. The third type are **intercepting ditches** and they are only found in locations where very high water tables have resulted in sheet flows of water towards the railroad across areas of land adjacent to the ROW; these areas are usually wetlands or wet hillsides. They are located parallel to the tracks, but at much greater distances than the side ditches. Their intercepted water is diverted to the nearest cross ditch.

The cross-ditches on the LVRT are, in general, in good condition. Forest debris and trash have blocked some channels, as have beavers, but most of the obstructions are easily removed, or are off the ROW and pose no threat to the LVRT. There is little or no evidence of erosion or silt buildups in the vast majority of the channels. An exception to this is the culverts that have had

beaver dams erected in a semi-circular pattern around their upper entrances. The dams have not obstructed water flow through the culvert or the ditches, but have resulted in considerable deposits of silt behind the dams. These silt deposits may, in some locations, be referred to as “Legacy Deposits” as they are likely to be from the time in Vermont when farming caused the erosion. In some cases along the ROW these deposits are over five or six feet high, and fill the bottoms of small valleys. In a few cases extreme storm flows have pushed woody debris over the top of the dams, or down stream channels, and blocked some culverts. Such blockages have resulted in several washouts, removing the culvert structure and the embankment.

The lateral or side ditches on the LVRT are in very poor condition. On an active, well-maintained ROW one would expect to find wide, open channels at least 12 to 18 inches deeper than the **bottom** of the ballast. On the LVRT the channels are shallow, and generally full of silt, woody debris, and ballast. **Generally, any water flows in these ditches appear to be the result of man-made changes to the landscape or drainage patterns, including encroachment activities, and not drainage from wetlands or intersected streams.** In many locations, due to a combination of the rail/tie removal activity, other vehicular traffic, or silt deposition from adjacent land disturbances, the ballast surface is lower than the bottom of the ditch channel, causing lateral drainage to flow through the ballast. This, in turn, has resulted in several washouts where water running down the ballast has ultimately washed out the side of an embankment when the ballast could no longer contain the flow. Finally, these are conditions observed where the side ditches are visible. A larger problem exists in the invisibility of many of the side ditches because of the growth of forest and brush right up to the edge of the ballast. In many locations the survey team could not safely find the ditches because of the density of the undergrowth. In any project to reclaim the ballast and side ditches the first priority would be to re-clear enough of the ROW to assess ditch conditions, drainage patterns, and repair methodologies.

Intercepting ditches on the LVRT are in very poor condition. These ditches were observed in only one location on the ROW and at that location they were almost invisible, filled with silt and undergrowth. There may be other locations where they were constructed, but the density of the vegetation keeps the ditches from being identified. There are locations where one would expect to find these ditches but the survey crew didn't. The reason may be that a damp, sunny, meadow hillside, or an area the farmer had to tread lightly when cutting the hay every summer in 1870, has reverted to a wet hillside today with the addition of forest and shade. From observing the drainage patterns along the ROW, the importance of these ditches, given the nature of a rail-trail, is very much lessened if the side ditches are kept clean and functional.

17.7 Culverts:

The culverts originally constructed on the StJ&LC Railroad were generally stone box and cast iron pipe culverts. After the railroad was constructed small wooden box culverts were introduced between the ties, in the ballast layer, or immediately below, to deal with minor local drainage conditions missed when assessing the original culvert needs. Today, all of the wood culverts are gone, except one combination stone-wood culvert at station 1295+27. A “subset” of culverts along the ROW is the “cattlepass” or passage for sheep and cattle belonging to farmers owning or leasing grazing land on both sides of the ROW. Since construction, a variety of culvert

materials have been used to supplement or replace culverts on the ROW including sections of old boiler casings, corrugated metal pipe (CMP), high density polyethylene (HDP), and concrete.

Stone box culverts were made of local ledge stone, generally schist, or cut granite. In general the granite culverts are in better condition than the ledge culverts because of the variability of the quality of schist. In both cases parallel stonewalls were constructed on a stone bed, and topped, or capped with large flat stones in the case of the schist culverts, and cut granite blocks on the granite culverts. Chock stones, and likely mortar, were introduced in the irregular spaces between the capstones to stop embankment, sub-grade or ballast material from “leaking” into the culvert. The mortar has leached out over the years, and some culverts have lost some chock stones resulting in the loss of sub-grade and/or ballast. This has manifested itself in the form of funnel-shaped depressions or cavities on the surface over the hole in the culvert. This condition is easily repaired and does not necessarily signal the loss or failure of the culvert.

A more serious source of damage to these structures is the return of trees to the ROW, and the presence of trees and roots growing on the structures. The roots, seeking water, have pried walls and capstones loose. On many culverts the first and sometimes second capstone is laying in front of the end of the culvert where tree roots pushed it. Capstone displacements and inlet/outlet repairs were documented.

Cast iron culverts are made of sections, generally twelve feet, of old bell and spigot-type pipe. Diameters range from 4” to 36”. All of the cast iron pipe culverts on the LVRT are in good condition although a few have pipe sections that have separated at the joint under the roadway. Cast iron culverts were utilized in locations where the culvert would be near the surface, so repair of these deficiencies should be reasonably easy.

It appears that the vast majority of stone culverts originally installed are still functional and working. Losses tend to be from washouts caused by trash blockages, cracking and failing of the capstones, and severe loss of the chock stones resulting in a large inflow of silt and mud. Losses have also occurred from the deterioration of the stone. Many of the larger stone box culverts and cattle passes are in excellent condition and the quality of the workmanship, although primitive is still evident. That craftsmanship, the beauty of the stonework, and their remote locations make them significant early engineering achievements and structures well worth preserving and maintaining.

New or replacement culverts of the aforementioned materials have been installed in many locations. Some are now so old that they have rusted out on the bottom or simply disintegrated. Many of the culverts of all types are blocked with silt or debris, or are completely silted out. The silt appears to be excess silt from off the ROW, and/ or silt that has settled out in the culvert from minor channel blockages (brush, weeds, etc) below the culvert and the quiescent condition that creates within the culvert.

Appendix “F” “Culvert Listing,” is a Table that lists all culverts that exist on the LVRT, and indicates the necessary work to be done to the culvert.

17.8 Bridges:

In accordance with the Vermont Pedestrian and Bicycle Facility Planning and Design Manual, the minimum structural design loading the bridge structures on the LVRT were evaluated against is an AASHTO H-10 loading (10,000 lbs per axle, 2 axles). Existing bridges were generally required to have at least ten more years of usable life. Some bridges may need additional load capability if they must be used by heavy construction equipment to access remote sites.

Defining what constitutes a bridge is the first problem of this assessment. From the Valuation Plans, or from the physical assessment, there **were** 86 locations where the structure in that location might have been considered a bridge. Some of those structures do not meet the state criteria for a bridge, but the work necessary on those structures for their structural integrity or for safety issues is so similar in nature to that needed on the majority of bridges that it seemed logical to call them bridges.

Of the 86 locations, 9 have been eliminated through the historic removal of the structure (generally to at-grade crossings), and 1 has been classified as a “normal” culvert, leaving 76 structures to evaluate. It should be noted that the one defining characteristic that kept several of these structures on the “bridge” listing was the eventual need for guardrail work at the site. The 76 structures are broken down into the following categories:

- Stone/Concrete Culverts- 2 ea
- Cattle Passes- 20 ea
- Metal Pipe-Arches- 3 ea
- Concrete- 6 ea
- Stone-Arch- 4 ea
- Wood Stringer- 2 ea
- Steel I-Beam- 10 ea
- Steel Deck Plate- 3 ea
- Steel Through-Plate- 4ea
- Steel I-beam, Pile Bent- 7 ea
- Steel Beam/ Plate, Wood Piling- 4 ea
- Steel Through-Truss- 5 ea
- Missing, Need Replacing- 6 ea

The condition and repair work needed for each structure may be found in Appendix Section E, Individual Bridge Sheets, and a short summary of those sheets is provided below:

Stone/ Concrete Culverts: Good condition but narrow enough to require guard railing.

Cattle Passes: Generally adequate to support LVRT trail loadings (FHWA H-10) as noted, except for one (BR 91), a wood stringer and pile structure, completely and dangerously rotted out, which should be demolished and filled in. (There is one other structure identical to this one (BR 67A) that is salvageable at station 3224+50.

Metal Pipe-Arches: Good condition but some are narrow enough to require guard railing.

Concrete: Generally adequate to support LVRT trail loadings. Bridge 57 was severely downgraded in the Edwards and Kelsey report through the misinterpretation of concrete deterioration. A closer examination revealed that although the bridge has a headwall problem the abutments and the roof slab are in good condition.

Stone-Arch: The arches of all four structures are in excellent condition and are more than capable of supporting LVRT and construction loadings. The headwall systems on all, and specifically Bridge 90, are in need of repair. At the time of their construction the masons did not adequately tie the wing walls into the arch structure- very difficult in mass-granite masonry- and the wings, and some portions of the top headwalls, have moved or separated from the bridge body over the years. This has been exacerbated through the allowance of trees, and their roots, to grow into the walls, further pushing the blocks off their foundations. Bridge 90 has lost an entire wing wall, and is close to losing two more.

Wood Stringer: There are only two short span bridges of this type and, if minor repairs are made, will easily support the LVRT loadings.

Steel I-Beam: With the generally minor repairs indicated, eight of the eleven structures in this class should perform adequately. Bridge 31 has adequate steel members for an H-10 loading- the bridge has two intermediate wooden bents that are unnecessary- but the wooden abutments and decking are rotted out. Further, the bridge may not have sufficient road clearance. The bridge underwent further evaluation to determine whether repair or replacement is the wisest solution. Bridge 65- a 16-foot span- is still a mystery. When found it appears to have been filled in with gravel (there is no evidence of a channel and this may have been a Cattle Pass), although the bridge deck is still present and is in good condition. Further investigation will be necessary this spring. Bridge 16L was removed by VTrans in May of 2008 it is their responsibility to replace the structure or to replace it with an at-grade crossing.

Steel Deck Plate: With the generally minor repairs indicated all three bridges would easily support the LVRT loadings.

Steel Through-Plate: With the exception of Bridge 63 these bridges are all capable of supporting LVRT loadings. Bridge 16L over VT Rte 2B has severe rust problems but appears adequate to supporting H-10 loadings. Further inspection would be necessary if construction loadings were anticipated. Bridge 63 has lost a small granite wing wall- probably to roots and frost- and some partial support of the steel superstructure, and must be repaired before it handles anything more than a pick-up truck. The necessary repairs are relatively minor in cost and magnitude.

Steel I-Beam, Pile Bent: Generally these bridges are in excellent condition and can easily support the LVRT loadings.

Steel Beam/Plate, Wood Piling: All the bridges in this class are in an advanced state of deterioration for the same reason; wood piling. Bridge 35 is salvageable but the intermediate pile bent will require cap and beam pad replacement, steel beam realignment, and continued surveillance of the piling condition. Bridges 68, 77, and 83 have serious piling problems, but the severity is unknown. Further, Bridges 77 and 83 have wood abutment systems that are rotted- out and failing. Increment borings of all the piling will be done this spring to determine whether they have sufficient life left to use, or whether new piling or complete replacement will be necessary. The steel superstructure on all the bridges is in fair condition and is salvageable. **None of these bridges (68, 77, and 83) are judged adequate to support H-10 loadings in their present condition.**

Steel Through-Truss: With the recommended repairs these bridges are more than adequate to support H-10 loadings. Bridge 59's southeast granite abutment has settled in the far past and a shim pad was added some time ago to correct the situation. The bridge corner elevations should be checked again to determine if the settlement has stabilized or that the shim pad be elevated.

Missing, Need Replacing: There are 6 structures that were destroyed or removed on the line; the washout at culvert 17D is so large and remote that a bridge is the only practical solution (see photo #75). Of the 5 missing spans Bridge 13, at the eastern end of the LVRT, requires a new eastern abutment, which was removed when the span was removed to improve the travel line of sight. Bridge A27, including abutments, was removed by VTrans about ten year ago because of very poor bridge alignment and width restrictions on VT Rte 15. The abutments on Bridges 34 and 48 are intact and usable. Bridge 49 was severely damaged by a flood several years ago and was removed by the Water Quality Division of the Vermont Department of Environmental Conservation (DEC) as part of their Floodplain Restoration Program (FRP). A location was constructed as part of that project for a replacement bridge pad on the western side of the Wild Branch. Remnants of the eastern abutment are still present. Bridge 16L, as previously indicated, is the responsibility of VTrans to replace or to otherwise provide a means of crossing VT RT 2B in Danville.

Appendix "G" "Master Bridge Listing," is a Table that indicates all of the bridges and their conditions.

17.9 Washouts:

There are several washouts on the ROW of varying severity and origin. Causes include culvert failure (type I), lateral ditch failure (type II), river or stream scour (type III), and washout depositions on the ROW (type IV). Culvert failures, almost all of which are stone boxes, appear to be caused either through a structural failure of the stonework, or debris (many times from beavers) blocking culvert entrances, causing an impoundment and eventual overflow over the railbed embankment. Lateral ditch failures refer to a ditch filled completely and overrun with silt, causing the water to travel down the railbed until it can find escape. The point of escape becomes a washout. River or stream scour washouts refer to locations where the railbed is directly

adjacent to the river or stream. The river scours away material along the bank ultimately removing portions or all of the railbed. Washout deposition washouts occur when an event, usually rainfall, off and above the ROW washes material down onto the ROW.

Given the narrow width of the land within the ROW, Type III washouts, adjacent to a running river, were thought to be the most serious to try to restore, especially considering their probability of recurrence, permitting, remote locations, and cost. Observations of all Type III washouts indicate that all are in an advanced state of natural healing, are not wide enough to impact the width of the ROW, and are not as numerous as originally thought. There are only five such washout sites. The Type III washout at station 4157+75 is not adjacent to the Lamoille River. In this location the river, in flood stage, removed approximately 80 feet of the entire Type I embankment several hundred feet beyond the nearest contact with the river.

Of particular note, because it does not fit into any of the four categories, is the washout that has occurred at station 243+66, near St. Johnsbury. Stormwater along route 2B above the LVRT Route 2B bridge overpass used to drain through a ditch built specifically for this purpose by the StJ&LC Railroad. The valuation plans show the ditch and the “rights” owned by the Railroad. The ditch ran from a point above the overpass west to culvert 16J under the LVRT. At some time within the past 20 years (?) this system was changed by VTrans to drain the water north to land between route 2B and the LVRT, but not into any ditch leading to a LVRT culvert. Over the years this water has eroded and damaged several acres of private land, and ultimately drained onto the ROW at station 252+53, where there is no culvert to carry the water under the railbed. The additional silt and water eventually filled the lateral ditches and washed out the railbed at station 243+66.

Appendix “H” “Washout Listing,” is a Table that lists and describes each washout that was located during the assessment.

17.10 Encroachments:

An encroachment on the ROW is a physical intrusion or trespass on the state property by an abutter in the form of any change from its original condition. Typical encroachments encountered during the assessment include leaves, trash, soil, tires, or junk dumped on the ROW, removal of ballast stone or trees from the ROW, construction of crossings or driveways across the ROW without AOT permission, running fences or sap lines on the ROW, planting of crops (corn) on the ROW, landscaping activities, conducting commercial operations on the ROW, and discharging contaminated water or septage on the ROW.

Appendix “I” “Encroachment Listing,” lists all the encroachments encountered on the LVRT, their location, description, and severity. Of particular note are the priority 1 and 2 encroachments that are the most serious. There are 10 priority I (critical, “showstoppers”) and roughly 42 priority II (serious) encroachments identified. While the Priority II are important and may be difficult to cure or eliminate, the priority I listings are such that a trail cannot be built through those areas until the conditions are corrected.

Details on the Priority I’s:

Station 1328+91; Site of an unregulated dump, including garbage, trash, rugs, furniture, brush and degradation of approximately 400' of ballast with silt and mud: photo. The erosion from this individual's property has also caused the washout at the west end of the encroachment.

Station 1516+00 to 1523+64; The Michaud Farm, site of several serious problems: The farm appears to have structures sited on the ROW, has degraded several hundred feet of ballast, re-graded some sections of the ROW, and most serious, appears to be draining dairy manure and other farm septage into the ROW lateral ditch directly into the nearby Lamoille River.

Station 1798+10 to 1804+58: Site of a local sawmill, which appears to be closed, that has degraded several hundred feet of ROW, including loss of grade, ditching, ballast, and the destruction or damage to two stone culverts.

Station 1914+46: This is the site of a farmer's road adjacent to the Lamoille River and the LVRT. Because the river has cut into his road, the farmer has cut into the LVRT to maintain his traveled way, damaging the LVRT embankment and wasting considerable ballast.

Station 2224+64 to 2226+10: This is the site of an individual's degrading of the ROW, and the theft of ballast, which is clearly visible from Rte 15! The abutter has piled junk (hundreds of old bicycles) along the ballast on the ROW, dumped debris on the ballast, and constructed his driveway with the ballast!

Station 2879 to 2890: A local resident described this as the "Old Patch Farm". It is the site of a decrepit dairy operation that has spilled onto the ROW. There's a manure pit, which appears to be edging on the ROW, several pieces of equipment on the ROW, and at least one renegade crossing.

Station 2928-2937: Site of a large gravel pit operation east of Johnson. The operation has encroached on the south side of the ROW with vast quantities of soil and gravel, and is posing a serious threat to a critical culvert belonging to the state (# 60A; sta 2936+50).

Station 2698+49 to 2974+50: Site of the Town of Johnson's garage and roads department. The town has destroyed several hundred feet of ROW to include embankment, drainage structures, and ballast.

Station 3032-3052: Site of a large gravel pit operation that has degraded several hundred feet of ROW with silt (completely covering the ballast), silted out an LVRT stone culvert, and possibly damaged wetland.

Station 4537+57: Site of a residential landowner with attitude issues. The encroachment includes loss of ballast and the inclusion of the ROW as part of the owner's lawn and back yard.

There are a few priority "II" encroachments of note also:

Station 79+45: The VTrans rte 2B overpass over the LVRT has seriously damaged the LVRT due to the uncontrolled storm water runoff from the bridge. Damage includes 200' of saturated trail bed, silted out ditches, and loss of ballast.

Station 844+93 (but there are several more Joe's Pond encroachments almost as bad): Site of damage to the ballast and ROW from the abutter's actions in dealing with drainage and development.

Station 1017+96: A growing dump behind a residence.

Station 2042+70 to 2050+02: Site of P & R Lumber operations encroaching on the ROW right up to the ballast.

Station 2590+35, and 3241+27: VTrans garage encroachments on the LVRT.

Station 4229+59: Site of a full-blown dump being created in a wetland adjacent to (and possibly on) the ROW. Locals are using the LVRT to bring garbage and trash to the dumpsite.

Station 4457+20: Site of a dairy operation encroachment similar to paragraph 3b, except that there are no structures on the LVRT. Farmer is draining feed septage into the LVRT lateral ditch, which then flows into the Missisquoi River.

Station 4463+70 to 4484+23: Site of another dairy operation encroaching various aspects of its operation on to the LVRT. Damage includes a stream contaminated with a dairy operation, and over 1000' of trail with loss of the south lateral ditch, and large piles of silt against the edge of the ballast.

Station 4879+92: Site of Vermont Brick's operations on both sides of the LVRT, including a renegade crossing, rubbish, seconds, and piles of dirt.

Encroachments are not only a legal, and a construction issue they also represent an environmental challenge. Many of the encroachments have changed natural drainage patterns, or have resulted in sites contaminated with soil, animal or feed wastes, and trash that will make permitting, remediation, and trail construction much more complex.

17.11 Crossings:

There were a large number, and variety of crossings noted during the survey, state and town roads, private, and renegade crossings. Potential contractor access points were also noted during the reconnaissance. Private crossings are the driveways, farm crossings, and other trails acknowledged and permitted on the LVRR Valuation Plans. Renegade crossings were also found in the field, they are those not shown on the LVRR Valuation Plans. A few of the renegade crossings are actually town roads, but most are driveways, and in the western portion of the trail, most are from ATV usage.

ATV usage of the trail was significant, with the majority of the usage at the western end. Little serious damage to the trail was noted. Also of note was the use of the trail by farmers, primarily

from Morrisville to Highgate, to travel from one field to another (tractors and cattle), or to avoid the use of state or town roads. The extent of the damage from farmer usage is unknown. The ballast in these areas is generally dirty and well infiltrated with silt, but this could also be the result of poor track maintenance or the activities of the track and tie removal contractor.

Appendix “J” “Crossing and Contractor Access Listing,” is a Table that lists and describes all LVRT crossings of public and private accesses and describes potential contractor access points.

17.12 Refuse and Waste Deposits:

The refuse and waste material found during the assessment may be categorized into two distinct sizes: large, purposeful deposits, and small, random incidents. The large deposits seem to occur as extensions on to the ROW from private property, or involving the ROW as a point of access to the dump locations. Because of their size and location they were considered encroachments and were identified and described in that section of the assessment report. With respect to the small, random incidents, the assessment team found a score or more locations where a few tires, a small pile of scrap lumber, a derelict bicycle or other appliance, some scrap metal, or all of the above were found adjacent to the ballasted surface. Even more common were the old metal buckets the railroad used to carry the spikes, and the miscellaneous hardware associated with track construction. None of these deposits appeared to include any hazardous substances, or incidence of spills. Some of the very old cars (model A’s and T’s) and other large objects observed near the edge of the ROW may actually have some historic significance. All of the small, incidental deposits would be easily removed and disposed of.

Appendix “K” “Trash and Debris Listing,” is a Table indicating sites that have issues with trash and/or debris.

17.13 Old Railroad Ties:

The track and tie removal contractor did an excellent job of removing all the ties on the line. However, there are still thousands of ties along the ROW in many large piles off the edge of many of the embankments. These ties date from past iterations of maintenance activities by past owners well before the recent project. An examination of these ties reveals that many were creosoted, but that the biological digestion of the preservative is almost complete and all that remains is a shell of celluloid material. The high level of vegetation growing up through the piles would also seem to indicate that no poisoning of the soil or environment remains from the presence of the ties. Most of these piles will finally disappear naturally within the next few years.

18.0 LVRT Proposed Alternative Description

The purpose of document is to provide a project work scope and construction methodology for this trail alignment for use in project alternative investigation, permitting, public comment, cost estimation, and eventual project design and construction.

The development process on this project, attempting to “shoehorn” the early project definition steps into a *normal* project process, has been challenging because the origin of the project, its characteristics, and the funding, are not typical to the type of project the system was designed to handle. Because of the differences, it is necessary to explain how those differences impact the development process, and to provide information, assumptions and explanations for the actions taken by the project *owner*, VAST, who is acting as a *town* or *municipality* for the purpose of following the project development process.

First, it is necessary to explain why additional “alternatives” in the traditional sense are not explored in the scoping process. The LVRT Purpose and Need Statement states the alignment for the trail should follow the track bed of the old railroad to satisfy the route and connection requirements, as well as simplifying the satisfaction of federally mandated ADA requirements.

The project- a rail trail- lies on a rail-banked ROW owned and controlled by the state. Federal law behind the railbanking process precludes “moving” the ROW off its surveyed alignment. A state law, Section 17, Act No 56 of 2003, passed by the General Assembly and effective 4 June 2003, directs that the rail-banked corridor ROW be converted into a rail trail, and another law, Section 16, Act No 141 authorized the state to lease the ROW to VAST for the rail trail. Finally, the congressional earmark of funding for the project specifies that the funding for the trail be spent along the ROW. Therefore, other than the “do not build” alternative, which is a non sequitur, there are no other alternative routes for the trail, assuming VAST is to use the federal funds, and the wishes of the public (legislation passed by the VT General Assembly), the Vermont Statewide Comprehensive Outdoor Recreation Plan (SCORP), the three Regional Planning Commissions, and the Vermont Pedestrian and Bicycle Policy Plan (VPBPP) are to be honored.

All work on the trail will be in compliance with the Federal Highway Administration’s requirements and guidelines as established by their Transportation Enhancement Program and applicable sections of the Americans with Disabilities Act. When applicable, Vermont’s Pedestrian and Bicycle Facility Planning and Design Manual, VTrans standards for vertical, horizontal and hydraulic clearance, shall be used when developing plans for the trail; and to prevent injury to nearby property, both public and private.

Next it is useful to review the sources of opinion and guidance VAST utilized in developing this trail alternative: Those sources include the results of the public hearing held on the trail management plan (written comments from which are posted on the LVRT website), discussions and meetings with the Friends of the Lamoille Valley Rail Trail, and the LVRT Advisory Committee, and discussions with a broad variety of trail developers, users, and critics. Finally, in this alternative it is important to review the type of work involved in constructing the trail, and how that construction takes place:

The trail can be broken down into two general tasks: constructing the trail proper, and constructing the trailheads. While trail alignment and construction efforts are relatively defined, ‘known quantities’, the trailheads may not be, and this aspect of a rail trail will continue to be a work in progress; the public’s trailhead needs in 2008 may change dramatically by 2013. As

population and development changes in a region so do the locations and sizes of the needed trailheads. In this trail proposal, VAST will suggest a number of trailhead sites, but these could easily change depending on comments received during the *public informational meetings*, the results of information received from VTrans Rail Section Real Property, VTrans ROW, the many local towns along the route, other grant work on the LVRT, and finally, the funding available on the project.

Because of the time, cost, and complexity associated with ROW actions, the only trailheads considered in this alternative, in this project, are those located on the Val Plans' ROW. Further, these may be easily eliminated if resource review and investigations reveal that the sites will cost the project significant funding, delays, or mitigation efforts. As a completed LVRT matures, more trailheads will be added, or subtracted, by the local communities, and the will of the public.

18.1 PROPOSED TRAIL CHARACTERISTICS AND CONSTRUCTION

METHODOLOGIES:

Most of the trail construction envisioned on the LVRT is very similar to, and may be accurately described as railroad maintenance and repair. Typical work tasks to be performed to construct the trail include clearing, ditch cleaning, grading and compaction of the ballast, and some re-ballasting, culvert repair, cleaning, and replacement, bridge repairs and replacements, fence repair and replacement, and signage repair and replacement.

The following sections will highlight and explain the work tasks and methodologies VAST proposes to use in the design and construction of this trail alignment.

18.1A - Experimental Trail Prototype:

Because it appears little maintenance of rail ROW's had been done in Vermont for many years, and the extent of the deterioration of the ROW is very serious, VAST was faced with devising effective construction techniques that would satisfy archeological, historical and environmental concerns, withstand the rigors of the field, developing cost estimates for those construction techniques, and staying within the limited funding available. This was a complex task, and the solution lay in experimenting with a small section of the ROW exhibiting many of the problems facing the project throughout its entire length; unstable soils, wetland slopes, uncontrolled brush and tree growth, silted-out ditches, plugged culverts, and access problems. If the construction solutions work on the prototype section they would work almost anywhere on the trail.

The experimental trail section was selected at a location where a recent "washout" required VAST to repair that situation. That location is from VT Rte 15 in East Hardwick, station 1569+00 to station 1600+90 (0.60 miles) on East Church Street. The paragraphs below explain how the work was attacked and the lessons learned from each step in trail construction:

18.1A.1 - Clearing:

The clearing of wild grape, sumac, ivy, vines, weeds, brush, saplings and trees- alive and dead- from the ROW is one of the largest and most important tasks of trail construction. The ROW is so cluttered and overgrown, the side ditches are invisible and slopes and drainage directions are obscured and disrupted by the vegetation. The root mat is now seriously infiltrating the ballast area making compaction, surfacing, and long term maintenance much more difficult and expensive. The ROW must be cleared back far enough to maintain ditches, eliminate most possibilities of trees falling on the traveled way, let sunlight in to promote grass growth on the shoulders and in the ditches, eliminate root mat in the ballast, and allow for the disposal of ditch silt on dry embankment slopes along the ROW during construction. Originally, VAST considered using hand labor and some herbicide use to deal with the vegetation. The vast area to be cleared (some 120+ acres over 93 miles), and the size of some of the trees, made this too time consuming and expensive. Handling and placement of all the cut vegetation-type material on the embankment slopes would also almost double the work effort. Further, comments from the management plan hearing made clear that a great majority of residents did not want any herbicide usage on the trail, during any phase of the work.

The first experiment, then, was the use of a FECON Brush Hog. This is a patented hydraulic attachment to a standard excavator, similar to a pavement grinder, which is capable of turning brush and trees into mulch. The device works well and the mulch it creates may be used to stabilize slopes, and line ditch inverts, or be returned to the forest floor. The FECON can reduce a 10" dbh pine or cedar completely to mulch in about 10 seconds. Care must be taken to keep the public away from the front of the device as it can throw debris 300'. See Appendix D for photos of views of this equipment. The device was very successful in reducing all the organic material it encountered into mulch. The mulch was useful in slope stabilization, and in dressing up the forest floor transitions to the side ditches. With proper technique the device leaves woody stubs under 6" high, almost unnoticeable with the application of the mulch. Specifications must also include language on damage to remaining trees, and limbing. The device also simplified the removal of trees damaging some of the stone culverts. By reducing the trees to mulch it facilitates the hand removal of the stump and roots from the masonry.

Clearing limits depend on the section width of the trail (see Typical Sections sheet, next page). For section I and IV types, little clearing is necessary, as vegetation on Type I slopes is needed for soil stabilization, and to act as a barrier, or "guard rail" for trail users. Type II and III sections require the most clearing to expose ditches, and open access to embankment slopes. Typical **maximum** widths would be 40- 45 feet in a ROW width of 66- 100 feet (The original ballasted area width is approximately 12 feet wide on the ROW). Weather-wise, clearing may be scheduled any time between the end of snow cover in the spring, to the beginning of snow cover in the fall.

18.1A.2 - Ditch Cleaning:

Ditch cleaning is the most important task in making this ROW a trail. The loss of the lateral ditches caused most of the damage that will cost the most to correct on this project, and their future performance will make or break the viability of the trail. A working, flat, side ditch on a railroad is a very basic tool available for insuring the rail beds bearing capacity, and the careful removal of excess water from the ballast and sub grade. And from a technical standpoint, one the most effective processes in our water treatment inventory is the **settlement** of dissolved material from water for its removal. The ditches on the railroad- or trail- serve as longitudinal settlement basins capable of removing all the silt and solids from water passing through them, and metering that flow out slowly so as not to cause erosion in ditches and channels downstream. And, as mentioned in VTrans' Culvert and Ditch Maintenance Procedures Document, "they function so well that over time, they fill in and must be restored to maintain their flow characteristics." Such is the state of the LVRT lateral ditch system.

Once exposed by the FECON clearing effort, determinations must be made on which direction to drain the ditches because all the side ditches on the LVRT have almost negligible slope; perhaps a maximum of 1%. Lateral ditches don't necessarily run to cross-ditches. Many simply end when the section of the railbed changes to an embankment-type section. So, ditch depths must also be determined to lower the water table in the sub grade, but not create a ditch that's not maintainable (too deep), or having excessive slope (over 1%). Once direction and depth are determined the ditches may be excavated, however ditch shape is also critical to their longevity and maintainability. The excavator on the experiment used an articulated "wrist" bucket with a laser level allowing three-dimensional shaping of the ditch at precise grades and depth. Project specifications will require this attention to detail. The transition between the ditch and the ballast also was of concern. This sloping area must be smooth and continuous so that, once vegetated (grass), it is easily mowed using an arm-mounted mower on a tractor. That transition area was monitored during the project to insure the trail surface-to-ditch invert was a smooth predictable surface. Finally, the entire disturbed areas were seeded and mulched with hay. A grassy surfaced- ditch adds cleaning capability to the ditch and guarantees silt will not leave the job site during trail work in the ballasted area. The grass seeding was successful and within three weeks a grass mat was present on the ditches.

The above approach could not have been done had VAST attempted to follow the normal cut section, and swale diagram, in VTrans Standard A-79, Typical Rail Trail. The swale slopes and description in the standard would suggest that the swale invert is located at least six (6) feet from the edge of the ballast for a ballast depth of at least one foot, and sub-grade drainage of at least another foot. On many sections of the LVRT that dimension is only three (3) feet, with a much steeper shoulder between the ballast and the invert. (This is another indicator of how the original builders saved construction funding by minimizing the width of the cut and fill work.) VAST will be requesting relief from following this standard in cleaning and re-establishing lateral ditches. **Again, it is VAST's intention to maintain existing ditches, not move or widen them beyond their existing locations.**

Disposal of ditch silt is also a problem requiring careful solutions. Unlike the material found in roadside ditches, the silt in the LVRT's ditches has no salt residue, and very little trash. There is a larger organic fraction consisting of leaves, wood and weeds. Usually also present is a visible amount of ballast from the tie and track removal project. If the ballast is sieved out, the remainder is a rich organic soil with reuse or resale capabilities. Because of the ballast, and no reasonable takers for the material, we elected to waste the soil on embankment shoulders along the ROW (approximately 300 cubic yards over a 200' stretch of embankment shoulder). After dumping, the soil was spread and sealed down slope with the excavator, and the bare surfaces were seeded and hayed. This procedure resulted in the complete stabilization of the silt; no material left the embankment shoulder. For the project, care will be taken during clearing operations to pre-locate specific shoulder embankments with the correct slope and drainage characteristics for silt deposition. But this is not the only use for this material. Some may be sold, and some used to deal with trailhead, road crossing, and washout locations where topsoil is needed. In the western sections of the trail, excess silt is generally the result of poor farming practices, plowing, etc, and the silt will be returned to the adjacent fields where it came from. VAST is also presently looking for VTrans properties along the route for stockpiling this and other construction material.

The use of the above techniques assumes the ballasted area is capable of supporting excavation equipment, usually tracked, and trucks for occasional removal of ditch silt. This will not be the case in several areas, especially in the east, because of the saturation of the roadbed. In those areas that are too soft to use trucks, it may be necessary to use tracked trucks (more expensive) or windrow the excavated ditch silt on the edge of the ballast until the roadbed has dried out enough to support the weight of traditional trucks. Assuming ditching may only occur between 1 May, and 15 September, it may be necessary to allow some of those saturated sections to dry out over a construction season before attempting to remove windrowed silt. That condition may also move those sections of the trail to the forefront in scheduling phases of the project.

18.1A.3 - Road Bed (ballasted area):

Once clearing has been completed, ditches have been re-established and the silt removed, work on the reconstruction of the ballasted area can commence. Originally, removing the root mat that has developed in the ballasted area was thought to involve, at some stage, the use of herbicides. Pending the final results next spring, the methods used to remove the roots last fall eliminated the need for herbicides. Those methods include repeated windrowing, and grading of the ballast material until the roots "float" to the surface. Penetrations appear to be about 6", and care must be taken to keep ballast from finding its way back into the ditches. Once the roots have been broken and removed, re-compaction and grading occur and the ballast is ready for the final courses. In locations where the majority of material in the roadbed was ballast, albeit dirty, the wearing course of the trail may be placed. In those locations where the majority of material in the roadbed is silt or clay it will be necessary to add supplemental gravel to insure trail bearing capacity, longevity, and maintainability. Based on conditions in the field, VAST estimates an additional six to eight inches of high quality bank run gravel to be necessary.

Also, the scarification and grading initially done on the experimental trail brought to the surface great quantities of old iron and steel track hardware, including spikes, bolts, tie plates, and joint bars; perhaps as much as ¼ ton per mile of track. Some of these items came close to damaging construction equipment, and continued to surface throughout the compaction and finishing of the trail. Project specifications will require the contractor to drag a magnet bar over the ballast after initial scarifying of the roadbed, or conducting a “FOD walk” of the ROW to remove the hardware, and collection of the scrap.

The ANR FRP has completed 11 sections of trail lowering along the LVRT. These sections of trail will have a high likelihood of experiencing flooding, and there is a concern that the VTrans specification for the gravel surface treatment on the trail would be very susceptible to washing and loss of strength if the flooding occurs. A more stable and cohesive material would be better, and such a material was tested on the experimental trail; VAST used crushed asphalt pavement for the test section. The material seems to be much more stable and solid through the frost season, and VAST will be evaluating this material as a possible change to the VTrans A-79 Rail Trail standard for the FRP sections.

18.1B - LVRT Construction Details:

18.1B.1 - Trail Location:

As previously mentioned, this alternative is based on keeping the trail on the original track centerline, and no wider than the original ballasts. Lateral ditches would also remain in the same locations. This will avoid potential historic, archeological, and environmental controversies, simplify construction, and aid VTrans in tracking the borders of the ROW. The two exceptions to this may be, first, at some of the serious encroachments, and will be left to VTrans and their efforts to rectify those situations. In any case the trail would not be off the Val Plans ROW, merely shifted to the edge of the ROW. Such a situation is likely at the Town of Johnson’s Town Garage (stations 2968-2974) where the ROW has been compromised, but could still allow the trail on the edge of the ROW. The second exception is a replacement bridge site, which will be covered in the bridge section of this document.

18.1B.2 - Clearing:

As explained in the experimental trail section, clearing limits are shown on the **Typical Sections** sheet. Clearing widths are dependent on the section type, and the presence and location of lateral ditches. Clearing means reducing the vegetation to mulch, and **will not include any grubbing, or any other disturbances to the forest floor outside the lateral ditch limit.**

18.1B.3 - Drainage:

Drainage will be accomplished by reestablishing preexisting drainage ditches as described in section 18.1B.4.

18.1B.4 - Ditching:

As explained in the experimental trail section for the lateral trail ditches. Work on the **lateral ditches** is confined to re-establishing and cleaning existing ditches. While this cleaning, seeding, and haying is the only disturbance past the ballast in forested areas, the plowed fields of the western half of the trail will require more work. In many locations farmers have plowed and planted right up to the ballast, or as close as they could get (photo 1258). This has resulted in substantial soil deposits, and occasionally small hills depending on the direction of the furrows, on and adjacent to the ballast; sometimes causing standing water on the stone because the fields are higher than the ballast and the ditches are gone. Work in areas where the ballasted area is at or below the fields will include re-establishment of the lateral ditches as before, re-grading of the shoulders outside of the lateral ditches, placement of the excess soil back on the adjacent fields, and establishment of a ten (10) foot wide grassed strip (on the ROW) between the fields and the ditches to protect the LVRT from the farmers plowing activities.

No excavation is necessary in **cross-ditch channels** (stream beds) **anywhere** along the LVRT. No work will be done anywhere along the LVRT to re-establish **intercepting ditches**. As part of the culvert cleaning and repair work, woody debris, culvert stones, trash (tires, ties, and scrap metal, etc) and minor silt deposits will be removed from those channels to promote flow, and clean up the ROW.

18.1B.5 - Culverts:

The condition of existing culverts, and proposed culvert work are shown in the Culvert Listing in **Appendix “F”**. **This lists all the culvert work, replacements, and new culverts necessary on the entire length of the LVRT.**

Code 6 culverts are generally those existing culverts that have deteriorated to the point where they no longer function, and must be replaced. Of the 48 listed, 27 are stone box culverts, 2 are wood box culverts, 3 are concrete pipe culverts, and 12 are corrugated metal pipe (cmp) culverts. Of the other 4, station 4157+75 is a candidate for a “miniature” Floodplain Restoration Project (FRP) location, and is being coordinated with Mr. Chris Brunelle of the Water Quality Division, DEC. Stations 1888+67 and 1948+86 are minor washout sites caused by the failure of adjacent culverts; the culverts to be placed in the washouts are likely not necessary if those adjacent culverts can be kept clean. They are being installed however, as a backup precaution to continuing plugging problems on the adjacent culverts. Culvert 69H was a 3X5 stone box lost from beaver damming in the region of the trail infested with beavers, mentioned in the Road Bed Conditions Section of the Assessment. It is the only culvert larger than a nominal 48” size in the entire list and, due of the adjacent beaver dams the flows are minimal. Because of the beaver activity in this area, VAST plans to coordinate this location with Mr. Brunelle as a possible FRP candidate, and is considering the installation of a small bridge in lieu of a culvert.

As mentioned in the assessment, several culverts now also have legacy silt deposits behind them, or impoundments from beaver activity. A few of those culverts are included in the above replacement listing. Care will be taken during the replacement work to maintain impoundment water levels to preserve wetlands, and/or silt deposits, by either raising the culvert invert elevation, or constructing a drop inlet structure on the inlet entrance.

Again, to re-emphasize this critical point: The repair and replacement activities associated with LVRT culverts will be designed so as not to result in invert elevation changes that would affect water tables, wetlands, or stream gradients.

Code 7 culverts are those LVRT culverts that have been damaged through silt deposition or other drainage deficiencies caused by adjacent VTrans drainage structures or roadways. VAST is seeking assistance from VTrans for these locations. Most involve removal of silt and debris from the culverts.

“NEW” culverts are all 12-inch cmps to be installed on the ROW to connect lateral ditches adjacent to the ballast. Flows are minimal and some of the culverts serve to relieve intermittent buildups of storm water on very long, flat stretches of the trail where the lateral ditch has no outlet. Others serve to pass storm water under poorly designed existing crossings where the lateral ditch has been filled. **All culvert replacements and new culvert work will be accomplished in accordance with VTrans Culvert and Ditch Maintenance Procedures.**

New embankment material for backfilling and sub-grade replacement may be necessary on all new culverts, and those undergoing repair activities. Because of the variety of sub-grade materials used in constructing the embankments, replacement embankment material must resemble the existing material, with respect to the angle of repose, if embankment widths are to be kept the same; that is, within the ROW. Once the new embankment slopes are top-soiled, the surfaces will be seeded and hayed at a minimum; more aggressive erosion protection measures may be necessary depending on the slope and soils, to include contour wattling, tree planting, plastic or concrete cellular grids, or hydro seeding with fiber celluloid mulch. VTrans Standard A-79 requires the placement of Type II stone fill as an armoring on slopes steeper than 1:2. Most embankment slopes on the LVRT fall in this category. VAST will be seeking relief from this requirement on some of these slopes because this solution may not be as effective as the use of the above proposed solutions.

Of all the remaining culverts, virtually all need various degrees of cleaning. **The Critical Culvert Conditions and Locations Summary** also lists those culverts requiring expedited cleaning or rebuilding because of their deteriorated condition or the flows observed through the culvert, or both. **For the stone culverts VAST intends to use the VYCC for reconstruction efforts to preserve their historic nature, and both VYCC and the Community Restitution Work Programs (CRWP) for cleaning and debrushing efforts.** The contractors reconstructing the roadbed during trail construction will routinely clean other culverts.

18.1B.6 - Roadbed:

Trail Width and Surface:

In accordance with the Vermont Pedestrian and Bicycle Facility Planning and Design Manual, and VTrans Standard A-79 (Typical Rail Trail) **the trail will be a minimum of ten feet wide with two-foot shoulders on each side.** However there are locations on the trail where holding this width will be difficult. Some embankment fills and ledge cuts are very steep and very narrow, and the space between bridge stiffeners on the through-plate girder bridges is only ten feet. Bridge 36 is in good condition but the bridge is only nine feet wide; with properly installed guardrails a minimum trail width of eight feet is easily accomplished, but will vary with the trail approach. Some of the embankment fills were constructed of ledge from the rock cuts. They are barely 12 feet wide, and have almost vertical side slopes, perhaps a 75 – 80 degree slope. They also are stable, and have large, old trees, etc growing in them right up to the ballast. Providing the slope angle and covering past the shoulders shown on the state standard (A-79) would be very difficult, would remove trees that will serve well as the required barrier on such slopes, and would undoubtedly cause considerable environmental damage. VAST will be asking for relief from this requirement. With respect to the width of the trail in general, **VAST intends to slope the shoulders with the same slope as the trail so that the visual appearance of the width of most of the trail will be 14 feet.** That width will then vary from 14 feet to as little as 12 feet on embankments and ledge cuts, and 10 feet on some bridges. Past the shoulders the surface will be grassed to and past the ditches (where ditches are present) to the resumption of forest duff and trees.

In reviewing Table 5-3 of the Vermont Pedestrian and Bicycle Facility Planning and Design Manual, and the FHWA “Designing Sidewalks and Trails for Access, Part II, Best Practices Design Guide”, Chapter 15, it appears that there are acceptable alternatives for trail surfaces that do not involve pavement or finely graded gravels. While fine gravels are best, they are also very expensive. A **firm and stable surface** is the requirement, however **slip resistance is listed as desirable although not always possible** in the FHWA design guide, an exception not noted in the Vermont manual. **In general, the regarding and recompaction of the ballast and soils combination found on the majority of the ballasted area, along with the addition of select, fine, bank-run gravel, or ¾ minus crusher run, would provide a firm and stable surface on the trail with a fair level of slip resistance, except after prolonged rains or frost conditions.** Better trail surfacing materials, such as the “sta-mat” (3/8” minus crusher run) may be used near town centers, and ultimately, as funding permits, over the entire length of the trail. **VAST will be seeking AOT acknowledgment of the adequacy of a properly graded and compacted ballast surface as a suitable intermediate trail surface during the phased construction of the LVRT.**

Special Conditions:

Very Narrow Embankments: On occasion, the ballasted area width falls below the VTrans acceptable minimum for the trail (eight feet wide with a one foot wide shoulder

on each side). In these locations VAST will supplement the width with bank-run gravel, topsoil the embankments with ditch silt, seed and mulch the exposed surfaces, and construct limited lengths of guard railing. These locations generally only occur near bridge abutments.

Beaver Region between stations 3394+00 and 3768+00: VAST has no intention of removing the beavers or the dams from this region. First, VAST has been unable to find any written policy from ANR on removing beavers or their structures. Anecdotally, ANR representatives have told many farmers that shooting beavers and removal of their structures is permissible; however an attempt at this strategy in this area probably would result in more environmental problems than a careful attempt to live within the beaver's comfort zone. Specifically, elevating a few short stretches, perhaps 1000 feet, of the trail by as little as six inches, and replacing approximately 300 feet of low (12") beaver dam presently on the ballast with a sand bag dam structure adjacent to the trail would probably allow the trail to be completed through this section. After completion, continued monitoring of this area will be very necessary, as will the future installation of "beaver deceiver"-type culvert structures to control any future attempts by the beavers to further raise ponding levels. The ballasted roadbed appears to still be capable of supporting construction traffic; if low bearing capacities are encountered, tracked trucks may be necessary for placement of the additional sub base and wearing course.

Wetlands: The LVRT does, occasionally, pass through wetlands. As described in the experimental trail section, VAST construction work limits are the ballasted areas and the existing locations of the lateral ditches. No work, other than superficial clearing is contemplated beyond the lateral ditches. This would seem to put the LVRT in compliance with Vermont Wetland Rule Section 6.2, paragraph 1 as an allowed use in a wetland area. Work on the ditches and the ballasted area will not alter the flow of water into or out of those wetlands (specifically because the rail bed is as flat, or flatter, than the adjacent wetland), nor will any draining, dredging, filling, or grading occur past the edge of the lateral ditch.

18.1B.7 - Bridges:

Necessary work scopes for repairs to each bridge structure may be found on the Bridge and Cattle Pass Information Sheet, and on Individual Bridge Feature Sheets in **Appendix "G"**. In general, on most traditional (steel) bridges, work includes wood stringer, deck and curb replacement, and installation of guard rail/ fencing systems to include approaches. Many of the other "bridges" (stone cattle passes, arch culverts, box culverts, and concrete structures) will require only guardrail systems. VAST intends to use treated wood (Alkaline Copper Quaternary, or ACQ- type preservative) for the underlying structural stringers (on many bridges these are the ties), generally 6X6 or larger members, but will use rough-cut untreated planking for the bridge decks. This decking will generally consist of 4"-12" wide by 8'-12' long- 3" wood planking from Tamarack (heartwood), Hemlock, and Pine logs. This wood is readily available in northern Vermont at very reasonable prices, is easily replaceable with no environmental problems with disposal, and will last about ten years. VAST is coordinating the specifications with

ANR's Forests, Parks and Recreation wood utilization foresters. Guard railing is called for in the state standards for trail bridges, however the state used vinyl-coated chain link fence on Missisquoi Trail bridges. Discussions with equestrian users indicate that both the chain link and guardrail heights specified (4') were too low, and that guardrail, or fencing with a minimum height of 6' would be safer and more reassuring to both horse and rider.

Bridges 13, A27, 34, 48, and 49 were removed and will be replaced; details and associated costs follow in a later paragraph. All these bridges except bridges 13, A27, and 49 will reutilize existing bridge abutments. The west abutment of bridge 13 is still there; St. Johnsbury as part of their Three Rivers Trail Project is replacing the east abutment, removed by VTrans several years ago. Bridge 49, to be located on the site of the old bridge, will use old pad locations existing on the eastern shore and a pad location designated by the ANR FRP engineer on the new western shore of the Wild Branch. The bridge that washed out at that location was a 60' span; the new bridge will be 160'. Bridge 17D was the site of a stone box culvert that was washed out. The size of the washout, and the remote location, suggest a replacement bridge to be a more economical and environmentally friendly solution. This bridge will also not use abutments, but rather pads constructed well back, perhaps 45 feet, from the washout, and the stream, for the bridge foundations.

Bridge A27 is a new bridge to be sited adjacent to the old overpass over VT rte 15 in Walden removed by VTrans in 1990. Approximately .15 acre of private property will be needed (ROW actions are underway) to construct this bridge.

Bridges 68, 77, and 83 are wood piling-supported steel bridges that may need replacement or reconstruction, pending further investigation this spring. If the pilings are too deteriorated, the VTrans Historic Resource Team will be consulted. If the bridges are considered historically important, the bridges will be reconstructed and new piling will be driven. If they are not important, the bridges will be removed and new structures will be provided.

Bridge 45, the Fisher Bridge, will require minor improvements to the embankments adjacent to the bridge, and some solution to the rails on the bridge deck, and the lack of guard rails. VAST is working to find answers with the Vermont Division for Historic Preservation, and VTrans.

Bridge 90 is a granite and ledge stone arch structure with serious wing wall structural problems. The northeast wing wall has collapsed, and the remaining three are in trouble. The arch is in good condition. Because of its historic nature, and beauty, the bridge will be carefully restored, probably with a project involving the VYCC and a local contractor with equipment heavy enough to lift the one and two ton stones comprising the wing walls.

No painting is planned on any of the steel bridges until the remainder of the lead paint falls off (99% of the paint has so far).

18.1B.8 - Replacement Bridge Background Information and Details:

Discussion on Bridge Structure Options:

Based on numerous discussions with persons who have been involved with bridge installations/repairs/replacements on similar “rails to trails” projects, some basic precepts regarding bridges become apparent. **For spans up to 50 feet** (and possibly up to 70’ depending on location and availability) used railcars (flatcars) are hands- down the most desirable option. They can easily support an H-20 loading and are somewhat readily available in the price range of \$250/lf. A somewhat typical 64-foot flatcar is 9’ 6” wide and weights about 64,000 lbs with wheel trucks, 55,000 lbs without wheel trucks, and is able to be shipped by low-bed tractor trailer. Cost to ship by rail (if rail worthy) is approximately \$2.00/mile. Railcars are easily one-half the cost of girder bridges for spans of 50’ and less.

For spans between 50’ but less than or equal to 70’, wide flange girders are a viable option if railcars of that length are not available. Stewart Engineering of Barnet, VT produced bridge plans for VAST that detail fabrication and construction of both wooden and steel spans from 10 to 100 feet. These plans utilize four each A-572 Grade 50 wide flange sections 4 feet on center with A-36 channel section vertical diaphragms and angle iron horizontal bracing. This somewhat standardized design appears practical and efficient, although the wooden deck design (2 X 6 PT on edge) should probably be replaced with a more efficient design, both from a cost and ease of maintenance standpoint. Discussions with structural steel suppliers/fabricators would indicate that spans beyond 70 to 80 feet are probably not competitive, price- wise, as compared to Bailey bridge- type structures or pre-fabricated truss-type bridges, which are now widely available for trail applications. In general, wide flange beams beyond 70 to 80 foot lengths are special handling at the fabrication yards and rail shipment costs and DOT permits for shipping them are problematic and more expensive. **For bridges in the H-10 loading criteria arena, the efficiency of truss designs proves itself at spans beyond 80 feet**, and standard girder bridges simply aren’t economically competitive beyond 80 feet.

On working with spans of 100 feet and greater, the fact that distributed loads produce a moment that is relative to the span length squared ($M= wl^2/8$) causes one to critically examine those distributed loads (i.e. examine opportunities to legitimately reduce them) or to look at options regarding shortening the span. Bridge A-27 (trail over Rte 15 in Walden) is an example of where shortening the span by building abutments inside the existing natural/topographical span may prove cost effective (cost estimates for various options are included in this report). Bailey bridges are viable in the longer spans, but visually unappealing compared to prefab trusses, particularly with regard to their negative camber in the longer spans. “Ball park” cost estimates received from Bailey bridge distributors indicate that they are more expensive than the pre-fab truss option, particularly when considering that the pre-fabs are pre-assembled (even though in sections) and installation with a crane should be fairly simple and far less expensive and time consuming than the build-out and launch of a Bailey.

Cost estimates of various options in the report are basic and “Ball Park” because more detailed data concerning the topography of the sites, soil conditions, equipment accessibility, availability of materials locally, etc. is not well developed at this time. As these site conditions are examined and analyzed, more detailed cost comparisons can be used to aid in determining the preferred option for each particular site. Refinement of the loading criteria for the individual structures based on discussions with VTrans may also be warranted. A critical consideration at each site is access, both for basic equipment such as trucks and excavators, but particularly for cranes, where in some cases two cranes will be required to support the splicing of two structure subsections together.

The use of weathering steel (A-588) has become very popular in the bridge construction industry, and there are a variety of reasons (many environmental) why it should be the material of choice for the replacement structures in this project. A-588 steel is only about five cents a pound more expensive than 50 ksi A-992 or A-572 steels, so the cost differential is negligible. Galvanizing is not as expensive as many believe, and it may be worth considering at Bridge A27 where (road) salt spray from traffic on Route 15 could have adverse effects on a weathering steel superstructure. VTrans experience and advice is advisable and needed with respect to this decision. Galvanizing should cost less than \$10,000 for this structure.

NOTE: The cost estimates for the replacement bridges do not include the decking; those costs are included as a separate line item in the project cost estimate. It is recommended that separate and specialized projects to do “the woodwork” (decks, curbs, rails, approach rails, etc.) at the bridges be used to gain cost advantages in doing multiple sites under one project, with lower bid prices due to economy of scale and the incorporation of salvaged wood material from one site being used at other sites.

Replacement Bridges: See Appendix “L” for Bridges and Estimate Data

18.1B.9 - Cattle Passes and Fencing:

During the assessment the team noted two locations (dairy farms) in the western half of the trail where the installation of a new cattle pass may be more advantageous than an attempt to devise a fence and crossing system. VAST will investigate the installation of CMP cattle passes at those locations. Also, as noted in the assessment, there are several miles of fence along the ballast and ROW that have been erected by farmers to control their cattle. In accordance with the lease, VAST is responsible for the installation of this fence and will work with the local abutters to provide and install, and/or move and reinstall any fences required by these individuals. The LVRTC is presently seeking abutter information on this and other owner needs as part of an outreach effort to all ROW abutters.

18.1B.10 - Washouts and Earth Slumps:

Washout types I (culvert failure) and II (lateral ditch failure) will be repaired by simply replacing the culverts and backfilling the embankments. Because of the variety of sub grade materials used in constructing the embankments, replacement embankment material must resemble the existing material, with respect to the angle of repose, if embankment widths are to be kept the same; that is, within the ROW. Once the new embankment slopes are top soiled, the surfaces will be seeded and hayed at a minimum; more aggressive erosion protection measures may be necessary depending on the slope and soils, to include contour wattling, tree planting, plastic or concrete cellular grids, or hydro seeding with fiber-celluloid mulch. It is notable that there aren't many washouts and most involve only partial loss of the embankment. VTrans Standard A-79 requires the placement of Type II stone fill as an armoring on slopes steeper than 1:2. Most embankment slopes on the LVRT fall in this category. VAST will be seeking relief from this requirement on some of these slopes because this solution may not be as effective as the use of the above proposed solutions.

Type III washouts are not serious enough on the LVRT to involve any actions on the embankment shoulders and edges bordering the Lamoille River (All five locations are adjacent to the Lamoille river). At these sites additional plantings will be introduced on to the bare slopes to advance the slope healing process. VAST has initiated efforts to have these locations included in the "Trees for Streams" program sponsored by the Lamoille County Natural Resources Conservation District (MS Christina Goodwin). For the trail at those locations, VAST plans to construct a 12-foot wide "boardwalk" arrangement on the ballast using the lateral ditch area on the opposite side of the washout to replace the missing trail width, still well within the ROW (see Boardwalk Concept Sketch, next page). The boardwalk concept will also facilitate the inclusion of guard railing, and be sloped slightly away from the washout to limit further exposure to storm runoff. The outboard lateral ditch at these locations will either be bridged or moved to the edge of the boardwalk at these locations.

A sixth washout at station 4157+75, previously mentioned in the Assessment Washouts, and Alternative Culverts sections, was caused by the Black Creek removing about 80 feet of the railroad embankment at a location several hundred feet from the river channel. Rather than replace the embankment VAST will handle the washout as a miniature FRP.

Type IV washouts involve the removal of silt and gravel deposited on the ROW from locations above, and sometimes many hundreds of feet from the ROW. Generally these deposits appear to be valuable sources of silt or gravel (one is from a town road washout from the floods of 1995). VAST will use this material for filling other washouts, repairing narrow embankment slopes, and eliminating trail grades that do not meet the maximum ADA trail requirements.

There are several small sites on the western end of the trail, and one large location, station 4512+52, where improper plowing techniques by the adjacent farmer have resulted in large quantities of topsoil and silt being deposited on the ROW and ballast. Although considered an 'encroachment', VAST proposes to return the soil to the farmer's field as a method of disposal, assuming this individual is willing to change plowing

methods and drainage patterns to preclude the return of the soil. A small storm water retention basin on the farmers land may also solve the problem.

During the experimental prototype trail work, a minor earth slump (approximately 2 CY of silt and mud) occurred **above the LVRT** on a steep slope adjacent to a culvert. This was to be expected with such soil, ground water, and slope conditions, and will likely occur again in this area (This was a really poor location to place the ROW.) This slump occurred as a result of the removal of supporting, previously slumped material in the ditch below. Removing the wet material, and packing the area with Type I stone fill stabilized the slump. Such minor slides may occasionally occur as the ditches are cleaned again in areas where the cut slopes are naturally unstable and wet.

18.1B.11- Crossings:

There are many state highway, town road, and private crossings on the ROW. VAST generally proposes to follow the guidance in the Vermont Pedestrian and Bicycle Facility Planning and Design Manual (Vermont Trails Manual) for alignment, approach angle, and signage. Many crossings are in areas of Vermont with little traffic, or population; VAST will be seeking relief from approach angle limitations (Manual paragraph 5.3.8) on some crossings where conditions do not warrant such stringent considerations. VAST will also be seeking relief from pavement and surface requirements on some town gravel road crossings (Manual paragraph 6. 2. 8) due to the restrictions this would place on the towns' ability to grade their roads, and the cost of trying to maintain these crossings. VAST also proposes to not provide any bollards or gate structures at any trail entrances anywhere along the trail. Experience on the Missisquoi Trail in Vermont, and the Northern Rail Trail in New Hampshire, has proven that these structures are easily avoided by entering the trail past the structure, often act as obstructions to legitimate users of the trail, do not deter illegitimate users, and quickly end up damaged beyond repair by support vehicles (snow plows and groomers) and vandals.

Several private crossing locations and a few town road crossings will require minor re-grading and drainage improvements due to vertical misalignments, poor grading practices, and ADA grade limitations. All work will be conducted with the same care as that done on the ballasted area and the lateral ditches. Work limits will not extend past the town roads' ROW's and no road closings will be necessary.

18.1B.12 - Signage:

Signage will be in accordance with the Vermont Trails Manual, and the federal MUTCD. No historic mileposts were noted on the LVRT, and the existing mileposts and whistle posts, etc. will be left undisturbed, as they are not in the way of trail construction. Existing culvert markers discovered during clearing and trail construction will be cleaned-up and reused. New mileposts (or kilometer posts, or both?) will be installed on the LVRT using Bridge 13 (Mt. Vernon Street, St. Johnsbury) as the eastern start point, and Robin Hood Drive (Swanton) as the western end point. Mileposts will be large cedar posts with the distances routed into the wood on both sides. The LVRTC shall establish

signing standards for the LVRT, and they shall approve the installation of all signs installed by users, and/or those wishing to advertise.

18.1B.13 - Encroachments:

The lease VAST has with the state of Vermont, through the Agency of Transportation (VTrans), makes resolution of encroachments the responsibility of the state (Article III, paragraph 3.1c). While resolution of the encroachments, and their impact on the completion of the LVRT, is likely to be a time consuming and difficult process, there is another serious issue associated with encroachment resolution the state must also address. That issue is one of environmental impact and permitting. Many of the encroachments, both minor and serious, pose significant environmental impacts in the form of illegal dumps, damage to stream beds from changes in drainage patterns, high BOD, nitrogen and phosphorus septage from farms, and siltation from gravel pits and commercial development. Actual repairs to the ballasted surface and associated ditching for trail construction will be minor compared to the permitting and mitigation efforts required on some of the identified encroachments. **VAST has not addressed these deficiencies or their solution in this document as VAST feels the permitting and mitigation, and solutions, are also the responsibility of the state and the abutters.** Nevertheless, VAST hopes to remain involved in the design of trail solutions through these areas. In many cases a trail can easily be constructed on the ROW without any further impact on the environment. **Appendix "P" includes a listing of all LVRT encroachments.**

18.1B.14 - Trailheads:

Trailhead construction on the LVRT, while an easy sighting and construction matter, may be an area of controversy and permitting difficulty. A trailhead is, simply, a place where one accesses the trail. Most trailheads are at easily accessible locations at the trail's junction with a road, an existing parking area near the trail, or an area adjacent to the trail that lends itself to that purpose. Trailheads may be on private or public land. A basic trailhead is a parking area and any signage necessary to educate the trail user on any knowledge he or she may need to know to use the trail. A small, simple trailhead may be parking for two or three cars and a sign. A large, well accoutermented trailhead may be paved space for 10 cars on up, a kiosk for maps, information, and advertising, a small building for bathrooms and even showers, and in wilderness areas, bear-proof trash receptacles.

On the LVRT the basic ROW, at 66' (4 rods) wide, is wide enough to accommodate a small, narrow trailhead at almost any intersection with another road. The LVRT Valuation Plans also show several parcels along the route, owned by the state, which may be good candidates for conversion to a trailhead. Also, the LVRT crosses a number of other trails, towns, and business properties that already have either trailheads or adjacent parking lots that could be used as trailheads. VAST has compiled a list of prospective trailheads from such candidate sites for the LVRT, and is presently seeking confirmation from VTrans, Rail Section, Property Management, and VTrans ROW to confirm public ownership, and availability of the LVRT parcels, **although they are not a part of this**

project. VAST will continue to research the private properties listed to determine owner willingness to accommodate a trailhead, **although they are not a part of this project.** Public property and individuals willing to donate rights are the obvious choice to keep the costs low as this project does not have sufficient funding to buy any trailhead parcels, **nor does this alternative include any land acquisitions or funding for trailheads.**

However, this list is neither complete nor finalized, nor will it ever be. Given the length of the trail, the communities it passes through, and the likely changes in population and direction of development, more trailheads are probably inevitable, and desirable. Some formalized during this project will probably be abandoned after a few years if they aren't used, or the property becomes more valuable to the state for another purpose. Therefore, VAST makes this list available as a starting point for the local towns along the trail, the LVRTC, and the LAC to evaluate the candidates, add or subtract from the list, and present the choices for inclusion in the final design. These are not alternatives for the purpose of project development.

18.1B.14.A - Trailhead design:

While the trail design does not contribute to pavement area or a significant increase in impervious areas, trailhead construction could. In order to minimize environmental impact, conserve funding, and make landowners more likely to donate property for trailhead space VAST recommends making all trailhead candidates in this alternative, and other rural trailheads, **grassed areas in lieu of gravel or pavement.** With the proper design, slope, and signage, grassed parking spaces should hold up well in lightly used rural environments. Minor graveled shoulders and approaches may be necessary but would only account for a small percentage of trailhead space. For those new trailheads in a more urban environment, or where traffic warrants the effort, concrete or synthetic plastic cellular "grass pavers" would provide a durable paved surface without soil compaction and loss of permeability, and will be used.

18.1B.14.B - Trailhead Locations:

Several of the trailhead locations identified already have parking lots or paved areas that may be used. They include: station 55+20 (trails start) and the use of the St. Johnsbury Park and Ride, station 506+80 and Marty's First Stop outside Danville, station 1730+50 and the use of a VTrans parking area along route 15*⁵, station 1805+00 in downtown Hardwick*, station 1862-1864 and the use of parking areas near the dealerships west of Hardwick*, station 2040+00 and the Fisher Bridge parking lot, station 2555+47 and the Oxbow Walking Path in Morrisville*, station 2700+55 and the use of the bypass around the old Cady's Falls bridge in Hyde Park*, station 2966+40 and the use of the Old Mill Park parking lot in Johnson, station 3368+80 and the use of adjacent parking for the Cambridge Greenway, station 3897-3899 and the many small parking areas along rte 36 in East Fairfield, station 4363+15 and the small park in downtown Sheldon*, station 4441+55 and the intersection with

⁵ The asterisk, in this section, indicates potential trailhead candidates in this alternative.

the Missisquoi Rail Trail in Sheldon Junction, station 4775+52 and the school parking lot in Highgate, and station 4978+31 along Robin Hood Road in Swanton (trails end). See Appendix C.8 for a complete trailhead listing and associated photos). Minor ROW actions and agreements will be necessary on many of these sites, but should not be difficult to obtain. Pending the results of the queries to VTrans mentioned earlier, VAST will begin trailhead location determinations with all the local parties.

18.1C - LVRT Cost Estimate and Information:

The cost estimate for the LVRT, without any trailhead expenses, is estimated at \$6.79 million. Detailed backup data and more information are available in **Appendix “M”**. Much of the costing information for the majority of site work associated with trail construction was obtained from unit costs developed from the Experimental Trail Prototype, and further information on how these prices were developed is also available in **Appendix “M”**. Please also note that the above estimate includes two replacement bridges, which have alternate sources of funding (bridges 34 and 48), and **does not include work associated with the permitting, mitigation, and cleanup of encroachments.**

18.1D - Town Participation:

It is expected that each town along the trail will have specific ideas, requirements, and proposals for the conduct of the trail within their immediate town centers. These proposals may include, but not be limited to operational hours, signage, trailheads, trail surface treatments, and future development projects. Some may also wish to donate resources to further these proposals. Within the context of the lease, the project budget, environmental, historical, and archeological considerations, and the proper use of federal funding, VAST will consider and incorporate all reasonable suggestions.

19.0 – Permitting

Based on a precedent set during the conversion of the Central Vermont Railroad, Richford Line into a four-season multi-use recreation trail, now known as the Missisquoi Valley Rail Trail, it is not anticipated that an Act 250 permit will be required. In a ruling handed down by the District 9 Environmental Commission Act 200 from the 1993 – 1994 Session was quoted. This Act follows:

NO. 200. AN ACT RELATING TO RAILROAD LINES AND ACT 250 APPLICABILITY.

(H.575)

It is hereby enacted by the General Assembly of the State of Vermont:

Sec. 1. 10 V.S.A. § 6001(3) is amended to read:

(3) "Development" means the construction of improvements on a tract or tracts of land, owned or controlled by a person, involving more than 10 acres of land within a radius of five miles of any point on any involved land, for commercial or industrial purposes. "Development" shall also mean the construction of improvements for commercial or industrial purposes on more than one acre of land within a municipality which has not adopted permanent zoning and subdivision bylaws. "Development" shall also mean the construction of improvements for commercial or industrial purposes on a tract or tracts of land, owned or controlled by a person, involving more than one acre of land within a municipality that has adopted permanent zoning and subdivision bylaws, if the municipality in which the proposed project is located has elected by ordinance, adopted under chapter 59 of Title 24, to have this jurisdiction apply. The word "development" shall mean the construction of housing projects such as cooperatives, condominiums, or dwellings, or construction or maintenance of mobile homes or trailer parks, with 10 or more units, constructed or maintained on a tract or tracts of land, owned or controlled by a person, within a radius of five miles of any point on any involved land, and within any continuous period of five years. The word "development" shall not include construction for farming, logging or forestry purposes below the elevation of 2500 feet. The word "development" also means the construction of improvements on a tract of land involving more than 10 acres which is to be used for municipal or state purposes. In computing the amount of land involved, land shall be included which is incident to the use such as lawns, parking areas, roadways, leaching fields and accessory buildings. In the case of a project undertaken by a railroad, no portion of a railroad line or railroad right-of-way that will not be physically altered as part of the project shall be included in computing the amount of land involved. In the case of a project undertaken by a person to construct a rail line or rail siding to connect to a railroad's line or right-of-way, only the land used for the rail line or rail siding that will be physically altered as part of the project shall be included in computing the amount of land involved. The word "development" shall not include an electric generation or transmission facility which requires a certificate of public good under section 248 of Title 30 or a natural gas facility as defined by subdivision 248(a)(3) of that title. The word "development" shall also mean the construction of improvements for commercial, industrial or residential use above the elevation of 2500 feet. The word "development" shall also mean exploration for fissionable source materials beyond the reconnaissance phase or the extraction or processing of fissionable source material. The word "development" shall also mean the drilling of an oil and gas well.

Sec. 2. 10 V.S.A. § 6081(h) is added to read:

(h) The repair or replacement of railroad facilities used for transportation purposes, as part of a railroad's maintenance, shall not be considered to be substantial changes and shall not require a permit as provided under subsection (a) of this section, provided that the replacement or repair does not result in the physical expansion of the railroad's facilities.

Approved: June 17, 1994

The LVRTC does anticipate that permits will be required to comply with other Vermont, Federal, State, and local rules and regulations. These permits include, but may not be limited to the following: Stormwater Runoff; Wetlands (State and Federal); Stream Bank Alteration; Historic Preservation; Federal Rivers and Streams and Endangered and Threatened Species.

20.0 Phased Construction

The LVRTC conversion project will take place in phases. These phases will be completed, as funding is available. The first major phase of the project will restore and rehabilitate the LVRTC, and will reestablish proper drainage throughout the corridor. Future phases will include the final grading of the existing surface of the rail bed that will be leveled and the final width of the trail, wherever possible, will be 10 feet wide with two-foot shoulders on both sides of the trail surface. The final trail surface will be one that complies with current Federal and State standards for rails to trails projects. During all phases of the project trail signage meeting standards for trails as described in the Manual for Uniform Traffic Control Devices (MUTCD) will be installed. Specialty signs, as required by user groups, for special events, shall be provided, installed and removed by that group on an as needed basis and as approved and authorized by the LVRTC. During all phases of the project, safety related features of the trail will be addressed as required, and will include railings, signage, guardrails, etc.

If LVRTC determines that any buildings or other facilities are not essential to its operations, it may request that VTrans relieve it of its obligations with respect to that portion of the trail. If it is decided that non-essential buildings or other facilities should be dismantled or removed, VAST shall pay to VTrans the net salvage value thereof, as it reasonably may be determined by VTrans.

LVRTC will comply with all present and hereinafter enacted environmental/clean up responsibility laws and will not permit any spills or discharges of hazardous substances or wastes on the trail. Compliance with all present and hereinafter enacted federal, state and local laws, ordinances, rules and regulations dealing with the storage, handling and transportation of hazardous substances and wastes shall be the responsibility of VAST.

20.01 Trail Construction, Maintenance and Phasing Recommendations:

With respect to trail construction contracting, VAST intends to use many small contracts, perhaps as many as 15 to 20, each with limited construction taskings. This will allow many local, small, talented contractors to bid on work near their home base, use locally available materials they have intimate knowledge of, and compete with their peers. Use of large contractors might speed the project up, but eliminate many local contractors, result in more money going to management and not to the project, result in more difficulties in project management and inspection, cause more minor environmental problems, and potentially cause difficulty with adjacent landowners. The small contractor

concept will also increase the contracting administration for VAST. VAST will investigate delegating some contracting and inspection effort to local towns having experience with FHWA funded LTF projects. Project formats on the trail work will be unit price. Observations during the experimental prototype trail revealed that prior to clearing, ditch quantities, and other associated work, could not be estimated due to the density and depth of the brush and debris.

In determining the process and timing of trail construction, and phasing, a first step is to recognize what factors stand in the way of trail construction and use, and what construction characteristics and phasing would extend available funding, insure careful construction, make the project more appealing to adjacent landowners, and benefit the local community.

First, the ROW has many culvert locations where the trail is in danger of washout or culvert loss because of culvert condition, or the extent of debris or vegetation blockage.

Phase I – An Architect/Engineer (AE) will be hired to guide the project through the permitting process. The AE will also be responsible for developing plans and specifications for the actual conversion of the LVRT railbed into a four-season, multiple use recreation and alternative transportation path. The AE will use the LVRT assessment, and “Experimental Trail Prototype” as the basis for their permitting and plan development.

Phase II – Phase II of the project corrects problems with culverts and other drainage structures. VAST has started on this work with the VT Youth Conservation Corp (VYCC), and grant applications for assistance. VAST sees Phase II continuing for the life of the project, prioritizing and accomplishing repair and cleaning efforts on all the 500+ culverts for the foreseeable future, and inclusion of this work in the final management/maintenance plan. The CRWP will also play a role in the correction and cleaning of culverts and bridges.

Phase III - Trail continuity is presently broken up into about 25 sections by washouts and missing or dangerous bridges. This not only stops users, but also some aspects of construction. Phase III would address efforts to eliminate all of those limitations, and would include bridge repair and renovation, and washout repair. Also restricting trail access to renovate the trail are wet areas caused by ditch loss, and culvert damage. Phase III would also address these issues since drying out some stretches of the ROW could take a year; therefore, would include clearing, drainage improvements, and bridge maintenance, and construction. Phase III would likely take about two construction seasons.

It is likely several towns may wish to fund and start work on trail sections within downtown areas and town centers. This work may be accommodated as an adjunct to Phase III, assuming appropriate contracting support is available, and there are no encroachments, washouts, culvert problems, or other missing structures along those sections of trail.








Phase IV - Once the trail is dry and accessible, efforts will begin to renovate the ballast, and construct the trail surface. This phase will likely take at least one construction season, depending on how the contracting is done, and contractor interest. By waiting to do this phase for a couple of years, this also gives the state and local communities a chance to eliminate some serious encroachments, and decide on trailhead locations. This phase would also include required signage.

Phase V - Trailhead construction, if any, would be included in this phase. Candidate sites that are already informal trailheads, or have parking already available (see listing in the **Trailhead Section Appendix “N”**) can be done much sooner, depending on ROW actions and local agreements, because they are not a part of the project.

Phase VI – Trail Maintenance

Staging areas, very small for the type of work on this project, for contractors will also be needed and VAST has included some in the ROW property research efforts requested of the Rail Section and VTrans ROW. VAST may also reuse some of the staging areas used by the rail and tie removal contractor.

LVRT Activity Timeline

Phase	2008	2009	2010	2011	2012	2013 & Beyond
Phase I	Permits & Engineering 					
Phase II	Clean & Repair Culverts 					
Phase III	Debrush, Ditch, Washout Repairs, & Bridges 					
Phase IV	Final Trail Surface & Signing 					
Phase V	Identify & Locate Trailheads 				Develop Trailheads 	
Phase VI	Conduct General Maintenance 					

21.0 Maintenance:

Trail design efforts are still ongoing, and trail construction; hopefully, will begin sometime in 2009. Emergency construction (maintenance?) efforts to unplug and rebuild stone culvert entrances, and debrush bridge abutments are set to occur the summer of 2008 with the Vermont Youth Conservation Corps (VYCC), at VAST's expense. This work is being undertaken to stop further deterioration of the ROW infrastructure, and preclude threatening washouts from occurring. This is the only work contemplated on the ROW until VAST reaches the point on the LTF project development schedule, which would allow the use of the federal funds.

Therefore, since the completed trail is still some years in the future the development of a detailed maintenance plan for the trail can only be theorized, and the plans characteristics only estimated. The assessment of the ROW revealed several salient points, which should be considered in a maintenance plan:

- The severity of deterioration of the ROW will increase the need for maintenance activities.
- The nature of the culverts (stone and granite) and the presence of trees and their root system, and beavers will increase the frequency of maintenance reconnaissance and activity.
- The presence of significant ATV activity will increase the need for trail observation.
- The presence of unruly rivers, poor ROW sighting, and some farm and commercial abutters, will require above average reconnaissance of embankments and other unstable areas, and abutter operations, respectively.
- The age of the bridges, and composition of their abutments will also require above average surveillance.

The unknowns of trail maintenance funding sources, where the labor for maintenance and reconnaissance activities is to come from, and where the equipment to do the work will come from also make detailed planning at this time very difficult. What can be accomplished is an estimate of the activities needed to maintain the trail, and their frequency.

21.1 - TRAIL MAINTENANCE RECOMMENDATIONS:

Appendix "O" - Trail Maintenance Schedule, lists tasks and their scheduling that represent a minimal level of maintenance and repair that should be accomplished on the LVRT. (No tasks have been generated for the trailheads that are to be maintained by the local communities, who will also be responsible for their development.) Of particular importance:

Trail Inspections: Once sections of the trail are complete, and especially when the entire trail is open, random "reconnaissance" of the trail is of critical importance for the first

year. A recommended procedure is to travel the trail slowly, logging on a form (recommended digitally) details, such as ATV activity and origins, trash, blow-downs, storm erosion, beaver activity, vandalism, fence problems, contract warranty issues, and signage problems. Many other maintenance activities may change their frequency based on the results of the logs and findings. Many other problems will also be identified and resolved before they become serious, and expensive. Eventually these “recons” may be reduced in frequency once an operational history of the various sections of the trail is developed.

Mowing Ditches and Far Shoulders: This is very necessary work, and potentially more difficult to accomplish than mowing of the trail shoulder because of the distance from the ballast. With a long enough outrigger mower (purchase recommended), the ditches and far shoulders should be mowable from a tractor, albeit with difficulty. It is important not to let tree and sapling growth return to the ditches if the ditches are to be maintained.

Leaf/ Debris Removal from Lateral Ditches: Ditch cleaning and de-silting represent a very large cost of the trail project. The continued maintenance of those ditches is critical to the long-term health of the trail. The ditches must be kept in working condition, and must not be allowed to fill again with debris or silt.

Culvert Inspections and Repairs: The culverts along the ROW will always need more repair and maintenance than those along highways due to their location in rural, forested areas, and the presence of beavers. Only constant vigilance will keep the trail from experiencing plugged culverts and washouts.

Trail Log: VAST must develop a trail log system to record maintenance activities performed, their station, frequency, equipment and personnel used, and costs. Logged information should also include such information as acts of vandalism, beaver activity, blow-downs, signage problems, washouts, erosion, culvert and ditch cleaning activities, and any other information that would be useful in developing budgets, personnel needs, trends in needs for law enforcement, maintenance contracts, etc. **All of this is best handled through the development of a computerized spreadsheet and mapping system so GPS/GIS information can be logged concurrently with the activity. This is highly recommended.**

Trail maintenance on the LVRT has already begun. Since VAST signed the lease the trail has already experienced a small landslide, and has taken action at another site to stop a washout. In 2007 VAST spent considerable funds to slow beaver activities, and repair their damage. On a trail this long traveling through some regions not much different than before the colonists came, with many bridges and culverts well over 100 years old, adjacent to rivers with distinct personalities, and bordered by a very opinionated and active population, observation, inspection, and regular and preventive maintenance procedures are a critical requirement. Failure to plan, budget, and spend the necessary maintenance funding will result in a trail quickly reverting to the conditions present before this project began.

21.2 Invasive Vegetation Management

Based on abutter comments during previous MP reviews, VAST does not plan on using herbicides during the construction or maintenance phases of the project. There is invasive vegetation that grows along, and in the LVRT corridor. At the request of ANR, other state agency, or town, VAST may use herbicides to control invasive vegetation.

VAST, if requested, will work with ANR, VTrans Landscape Coordinator and the Agency of Agriculture, Food & Markets Division, to develop a viable Invasive Vegetation Management Plan to be included as a future appendix of the Development and Maintenance Plan, a part of this MP. If the adopted plan includes the application of herbicides, that application will comply with all laws and rules of the State of Vermont **and will only be allowed for spot applications to address invasive vegetation that is not native to Vermont.**

Prior to the application of any herbicides, all adjoining landowners will be notified **directly as well as noticed in local newspapers** and given ample time to object to that usage. Where objections are noted, other means of vegetation control and management will be used on those properties.

Any area where herbicide use is directed will be signed to warn trail users of its presence. The signs will be placed at least 24 hrs in advance and will remain for some period after application to be determined by the VTrans Landscape Coordinator based on the characteristics of the herbicide used.

Sample signing and notification guidelines below:

21.2A Posting and notification:

(1) Before beginning each application, the applicator(s) shall post signs on the treated property at intervals no greater than one hundred (100) feet along all public and private rights-of-way. All properties, regardless of size, must post a minimum of two (2) signs at conspicuous points of access to the property. The specifications of the sign shall be as follows:

- a. Shall be at least four (4) inches by five (5) inches, of sturdy, weather-resistant material;
- b. Shall be with contrasting colors using the indicated point type size;
- c. Shall display the following warning on the front of the sign:

CAUTION
HERBICIDE APPLICATION
CAUTION
KEEP OFF
WHILE POSTED

CUSTOMER:
PLEASE REMOVE
AFTER 24 HOURS

(2) Both the fluorescent green symbol commonly known as "Mr. Yuk" and the international slash in a circle superimposed upon representational figures of an adult, child and dog as well as instructions that signs must remain posted for at least twenty-four (24) hours:

- a. Shall be posted at least twelve (12) inches above the ground;
- b. Shall contain the date and time of application on the back of the sign;
- c. The back of the sign shall contain the emergency numbers for poison control and 911, the city health officer's number for complaints, the brand or chemical name and concentration, and the name of the applicator's company.

21.3 Emergency Maintenance

The recommended daily reconnaissance of the trail will allow the rapid identification of problems and facilitate the identification of solutions and the source of materials and labor. Agencies potentially to be involved once an emergency has been identified include VTrans Rail Section, ANR (river engineers and environmental specialists), Department of Agriculture, and local and state police forces. Procedures will be developed for the communication efforts needed, and the meetings necessary to initiate action on emergency situations once the nature of the maintenance force and leadership structure are defined.

It should also be noted that an aspect of emergency maintenance is the use of the trail by emergency forces using the trail to access civilian emergencies, or to rescue individuals off the trail. Careful procedures with respect to these emergency forces must also be developed once the trail is opened to insure the agencies involved are educated as to the limits and nature of the trail. This is especially true of bridge classification (load limits), and other physical limitations.

21.4 Non-Winter Maintenance

For the purposes of this trail maintenance plan, seasonal maintenance falls into the two practical seasons on this trail, winter maintenance during the snow-covered, winter activity (snowmobiling, mushing, cross-country skiing, etc) portion of the year- generally December to April, and the non-winter maintenance during the remainder of the year when the trail is either closed between the two seasons for snow melting and/or to dry out, and for users such as equestrian, bicycling, hiking, running, walking, etc. **Appendix "O" - Trail Maintenance Schedule**, is geared towards the latter period.

21.5 Winter Maintenance

Local snowmobile clubs, in coordination with VAST, will be responsible for additional maintenance for their sport such as additional temporary signage, law enforcement of posted speed limits, clean up of trash, limiting of use with curfew hours, snowmobile trail grooming and marking areas where the path has a higher volume of joint use with cross country skiing, school functions or other user groups.

22.0 Capital Improvements for Future

22.1 - Fencing in accordance with 5VSA§3642

1. Farm Style Fencing will be maintained along the corridor where it is necessary to protect crop fields or to prevent livestock from entering upon the pathway from abutting pastures and as necessary to meet statutory obligations. The LVRTC will meet with landowners along the corridor who have expressed concerns and their fencing needs have been documented. Farm Style Fencing consists of 6' posts installed in the ground approximately 2 feet, leaving 4 feet showing above the ground. Attached to the posts will be two strands of barbwire fencing or electrical wire strands. Said fence installation will be constructed at the limits of the pathway right-of-way.
2. 6' Woven Wire Fencing will be proposed at areas where pathway and extended village areas require separation for safety reasons. This could be as an attachment to a bridge located within the Town limits to prevent people from hanging off the bridge abutments. Installation of woven wire fencing may also be needed for safety along the village area pathway sections where there is a drop off bank situation or for separation in an area where a parallel roadway is below the grade of the railbed.
3. *Note: In the development of a "natural" path to be used as a multi-use trail it is not the intention of the Committee to fence the entire rail corridor. Such action would cause non-access areas to the adjoining rivers in the western end now used by anglers and canoe enthusiasts. We need to include access off the pathway to areas that are considered recreation areas and abut the corridor. Also, it would impair the free movement of wildlife that inhabits the entire rail corridor and is a vital part of a "natural pathway." The LVRTC desires to keep this pathway open as much as possible for the pleasure and enjoyment of the users as well as unencumbered use by wildlife.*

22.2 - Control Barriers

1. In an effort to eliminate as much fencing as possible control barriers may be erected along steep slope areas. These control barriers will be designed and engineered to applicable standards.
2. Another option would be the planting of boundary line trees along areas where there are summer vacation homes (such as the Joes Pond Area) between the tracks and

waterway. Also, this method could be used in Village or Town Areas to create a sound barrier between the corridor boundary and an abutting landowner's house.

3. Control Unauthorized Vehicle Access – A system will be developed that will limit access to the LVRT by unauthorized motorized vehicles, with the exception of snowmobiles during the open snowmobile season.

22.3 - Village and Town Areas

Village and Town areas may wish to upgrade the path surface material these limited conversions can be addressed with a written agreement between the village and/or town and VAST. Nothing in this plan shall limit the ability of a municipality to establish stricter standards, through the adoption of municipal ordinances, for the use of the trail within the boundaries of the municipality. However, permitted legal uses shall not be prohibited by a municipal ordinance.

In previous discussions with town Selectboards, it was stressed that the conversion would try to accommodate the wishes of the individual towns. If a town is interested in something special, such as asphalt pavement in the village area, the LVRTC will work with them in order to accomplish their goals. The added cost of installation and future maintenance would be the town's responsibility, and would be handled with a written agreement between VAST and the town. (A good example would be the Three Rivers Bike Path in St. Johnsbury, their proposal shows using the first one-mile section of the corridor. The St. Johnsbury Selectboard has been assured that both projects can co-exist in the corridor. Letters of understanding have been exchanged documenting the willingness to work with others and resolve any conflicts that arise.)

22.4 - Trailheads

The development of trailheads has been discussed earlier in the plan and as shown in **Appendix "N"** of the Management Plan.

23.0 Future Development Opportunities

After the trail has been rehabilitated to basic trail standards the Committee will address future development of the trail corridor to accommodate and enhance the use of this asset. Working with the Regional Planning Commissions, we have been made aware of the following future plans that communities are working on. It is our goal to continue to work with the affected communities to include future enhancements along the entire trail.

- A. The construction of a connecting trail from the railbed at Bridge #12, alongside US Route 5 South, down to the Comfort Inn would provide both summer and winter

- access to lodging for users of the rail corridor. It would create a continual use of this facility with a resulting positive economic impact. The construction of such an access would also enhance the proposed St. Johnsbury Three Rivers Bike Path that also connects at this designated point on the trail corridor.
- B. Another access would be to the Fairbanks Inn located on US Route 2 entering St. Johnsbury from the west. With the conversion of a road crossing on Mt. Vernon Street, with permission from the Town, winter and summer users could obtain access by using Mt. Vernon Street or High Street to the Inn. It is anticipated that a bridge could be built to accommodate users to the Inn from High Street where there are presently old abandoned buildings. This would keep congestion away from residential homes in the immediate area.
 - C. On US Route 2 across from the Fairbanks Inn is a parking lot that could be used as a trailhead and there will be access in the St. Johnsbury Area to Recreation Fields, Parks, and Swimming Facilities.
 - D. Developing a program with the schools along the corridor to use the pathway in conjunction with their self help programs and gym programs, such as running, jogging, or biking, as well as their cross country ski program would be beneficial to the communities. The ATF will provide a protected outdoor recreation area and it would get children and others out into the natural surroundings. Schools in St. Johnsbury, Danville, Hardwick, Wolcott, Morrisville, Hyde Park, Johnson, Highgate and Swanton are all within walking distance of the ATF.
 - E. This ATF already connects with the Long Trail, Catamount Trail System, Missisquoi Valley Rail Trail, and the Cambridge Bike Path. As other north-south paths are developed they will intersect with this corridor. Swanton and St. Johnsbury are in the process of developing pathways at their respective ends of the trail. If bridge 96 was replaced at the western end, it could be possible to connect with a path extending to Lake Champlain.