

## SECTION I:

# Literature Review Summary

Researchers focused on five areas of background research for this project:

- General RWT studies;
- Specific RWT project documentation;
- Legal analyses of the issues and cases that have defined the relationships between railroads, adjacent property owners, the public, and trail managers;
- Development of technologies to monitor trespass activity along active rail lines; and
- Current RWT practice in Australia, Canada, and Europe.

Since trails within active rail corridors represent a relatively new concept, most of the research relating to existing practices and facilities has been conducted within the past five years on a relatively small number of facilities. The following summary concentrates on those research findings with the most immediate application to RWTs.

### **Rail-with-Trail Studies**

One of the earliest significant discussions on the topic of RWTs occurred as a result of an FRA-led forum held as part of the 1998 International Trails and Greenways Conference in San Diego. The major purpose of this forum was for both rail and trail stakeholders to identify the issues associated with RWTs and to determine their order of importance. Carolyn Cook (former Program Director, Crossing Safety, Railroad Commission of Texas; current Assistant Crossing and Trespass Prevention Region 5 Manager, Federal Railroad Administration) wrote an unpublished summary report, “A Working Outline of the Major Issues Related to Multi-Use Recreational Trails Located Near Active Rail Lines,” a work in progress of the Rails-with-Trails Task Force initiated at a pre-conference meeting at the First Annual International Trails and Greenways Conference (Federal Railroad Administration, 1998).



Joggers on the Burlington Waterfront Bikeway. Burlington, VT

Key aspects identified were liability issues, planning process, design issues, highway crossings, illegal crossing and trespassing issues, security, crime and vandalism concerns, safety and education issues, RWTs co-existing with railroad operations and management, and trail operations and management.

The Rails-to-Trails Conservancy (Kraich, 1997) published *Rails-with-Trails: Sharing Corridors for Transportation and Recreation*. It listed 49 existing RWTs through surveys of trail managers. The study provided detailed information on the physical and operating characteristics of the facilities. The study summary states that trails are compatible with active railroads, even high-speed and high-frequency/density mainline tracks.

The Rails-to-Trails Conservancy (Morris, 2000) published a study update, *Rails-with-Trails: Design, Management, and Operating Characteristics of 61 Trails Along Active Rail Lines*. Again, relying on interviews with trail managers, the study offers an overwhelmingly positive overview of existing RWTs. The study makes the following conclusions:

- RWTs “are just as safe as other trails;”
- A wide range of successful designs exists;
- About one third of trail managers believe railroad officials are supportive of the RWT; and
- The vast majority of RWTs are insured through existing government coverage similar to other trails.

The railroad companies’ perspective was examined in *Rails with Trails* (Wait,1998). The Wheeling Corporation, parent company of the Wheeling and Lake Erie Railway Company and the Akron Barberton Cluster Railway, privately produced and distributed this report. It presents a summary of the problems facing railroads, including vandalism, trespassing, injuries, and fatalities. The report outlines the circumstances (explained in more detail in *Section III*) under which the Wheeling Corporation will consider a trail. These include considerations of train speed and function, property availability, proper trail separation, suitable legal arrangements, property compensation, and clearly defined operations and maintenance responsibility.

### Individual Studies and Master Plans

With respect to individual studies and master plans for RWT projects, very little has been written on safety and trespassing issues. Finding written documentation on RWT safety for individual projects was difficult because:

- A significant percentage of trails are built with no written master plan.
- For the trails that do have master plan reports, these reports are usually prepared before the trail is built, in the form of a master plan report and/or written agreement between the railroad and the trail developer/manager. The reports often do not cover, or only briefly touch on, safety issues related to the adjacent active line. After the trail has been built, documentation of safety issues is scarce.



- Master plan copies are rare for projects built before 1995. The master plan authors often are difficult to find, having turned over the management of the trail to other organizations or individuals.

For these reasons, the literature search concentrates on a sampling of RWT projects built later than 1995.

*Three Rivers Heritage Trail Master Plan (Baldwin Borough Segment), Pennsylvania, 1999*

The Baldwin Borough Segment of the Three Rivers Heritage Trail is a 4 km (2.5 mi) RWT in Pittsburgh, Pennsylvania, that is yet to be constructed. The CSX railroad company operates at least one train per day at 65 to 80 km/h (40 to 50 mi/h). CSX was concerned about liability and trespassing during the negotiations for this trail. It therefore stipulated a number of design requirements as part of their agreement to grant right-of-way to the Friends of the Riverfront.

The “Master Plan for the Three Rivers Heritage Trail — Baldwin Borough Segment” (October 1999 Draft) notes that there are two central issues related to the shared use of this corridor:

- Maintaining access for railroad maintenance. An access road that is separate from the trail will be built by CSX for maintenance of the rail line and the utilities that share the corridor.
- Security of the railroad property. A chain link fence that is 1.8 m (6 ft) high will be placed between the trail and the active rail line.

*Five Star Trail – Terms of Agreement with Railroad, Pennsylvania, 1996*

The Five Star Trail is a 6.4 km (4 mi) RWT that links Youngwood to Greensburg, Pennsylvania. This freight line carries two trains per day (southern section) at a speed of approximately 32 km/h (20 mi/h).

The construction plan for the Five Star Trail details a number of safety features that were part of the right-of-way agreement between the Regional Trail Council and Southwestern Pennsylvania Railroad (SPRR). The bylaws of the Regional Trail Council state that its purpose is to “maintain good relations and communications with the Westmoreland County Industrial Development Corporation (WIDC) and the SPRR, and to satisfy the requirements of the right-of-way entry agreement between the Regional Trail Council, the WIDC and SPRR.”

Officials expected the Five Star Trail to eliminate problems related to an unofficial jogging/walking trail that crisscrossed the active tracks and was only 0.9 to 1.2 m (3 to 4 ft) away from the active track.

The construction plan describes the following safety features for this RWT:

- Locate parking areas on the same side of the tracks as the trail, eliminating the need for people to cross the tracks.
- Construct the trail on one side of the tracks, with no crossings.
- Maintain a minimum distance of 1.95 m (6.5 ft) between the track centerline and the trail. Wherever physically possible, locate the trail further from the tracks.



- Maintain an area of rock ballast and vegetation between the trail and tracks.
- Place a 1.4 m (54 in) tall fence between the track and the trail in a few constrained locations with less than 3 m (10 ft) of buffer space available.
- Place markers every 61 m (200 ft) between the track and trail to explain rules and regulations.

The construction plan also notes that the proposed trail improvements would be beneficial to the railroad because the corridor had been poorly maintained for many years. In fact, the RTC removed more than 90 metric tons (100 U.S. tons) of trash from the corridor, improved drainage conditions, and continues to maintain the vegetation in the corridor.

#### *Silver Creek Bike Trail, Minnesota, 1993*

The Silver Creek Bike Trail is a 2.1 km (1.3 mi) RWT in Rochester, Minnesota. The Dakota, Minnesota and Eastern Railroad (DME) company operates a freight line that carries two trains per day. The funding application to the Minnesota Department of Transportation for this project describes the safety measures that had been agreed upon by the City and DME. The track right-of-way is 30 m (100 ft) wide with the rails in the center of the right-of-way. DME required a minimum 3.2 m (10.5 ft) setback from the track centerline to the edge of the trail, with no signs or other obstructions in that space. For most of the length, the trail is set back approximately 9.1 m (30 ft) without constructed barriers.

The application also describes the agreements made with DME for two at-grade crossings and one undercrossing (through an existing drainage culvert). Because of the slow speed of the trains (less than 16 km/h (10 mi/h)) and good visibility, the City installed no active warning devices at the at-grade crossing locations. According to the project contact, no safety problems have arisen since the installation of the RWT.

#### *West Orange Rail-Trail Master Plan, Florida, 1996*

The West Orange Trail extends along an active railroad for about a kilometer of its 8.8 km (5.5 mi) length. This section of trail is in downtown Winter Garden, Florida. CSX Corporation owns the freight line and carries one train per day at approximately 8 km/h (5 mi/h).

The “Master Plan for the West Orange Trail” describes the agreed-upon design features between CSX and Orange County. CSX granted an easement for trail construction. Since the trains move very slowly through downtown Winter Garden (8 km/h (5 mi/h)), they agreed on a low, 1.2 m (4 ft) tall chain link fence between the trail and the tracks. The minimum setback from the track centerline to the edge of the trail is 2.4 m (7.8 ft) as mandated by Florida statute.

### **Liability of Rails-with-Trails**

Because RWTs have been recognized only recently in trail design, there is limited legal authority on this subject. The following three articles and publications are considered the most analogous to RWT issues.



The Rails-to-Trails Conservancy, in cooperation with the National Park Service's Rivers, Trails and Conservation Assistance Program, published *Rail-Trails and Liability: A Primer on Trail-Related Liability Issues and Risk Management Techniques*. Hugh Morris (2000) provides an overview of legal mechanisms that protect both trail managers and adjacent landowners, as well as a discussion on risk management techniques.

Morris concludes that most States have laws that substantially reduce public and private landowner liability for all types of trails, including RWTs. He states that experience shows that neither public agencies nor private landowners have suffered from trail development. "Adjacent landowners are not at risk as long as they abstain from 'willful and wanton misconduct' against trespassers such as recklessly or intentionally creating a hazard. Trail managers minimize liability exposure provided they design and manage the trail in a responsible manner and do not charge for trail access."

The *Coastal Rail Trail: Project Study Report* (Ferster and Jones, 1997) includes a review of the liability issues associated with RWTs under California law. They discuss the legal liability for governments operating the trails, the railroads, and adjacent property owners. Ferster and Jones also analyze the impact of the California Torts Claims Act and California's recreational use statute (see *Appendix B*) on the issue of liability.

The report concludes that government liability will be limited with regard to RWTs by general governmental immunities. In addition, it concludes that operators, railroads, and adjacent property owners are protected from liability by a recreational use statute (RUS) that provides protection to landowners who allow the public to use their land for recreational purposes. All 50 States have such RUSs, as discussed further in *Section IV*. Ferster contributed significantly to this *Rails-with-Trails: Lessons Learned* study.

In an article from *Public Management* magazine titled "Putting Value on Rail-Trails," Howser (1997) writes of the economic and environmental benefits to be gained from converting abandoned rails to trails. The author raises the potential to restart a rail line if it is economically viable, as well as potential opposition from landowners who own reversionary rights along the right-of-way. These issues are relevant to RWTs because planners must understand future plans of railroads. Not only can rail lines be banked, but lines can be upgraded and expanded to double tracks. The author concludes that adjacent landowners, even those initially opposed, are ultimately happier — both aesthetically and economically — with the trail present.

### **Innovative Technological and Operational Improvements**

Individual railroads, States, and the Federal government are constantly trying to increase safety along rail rights-of-way. While these efforts to date have not been focused on RWTs, the goal of improving the safety and security of areas close to train operations is a consistent concern.

Individual railroads have spent considerable time and effort in the development of monitoring technologies to control trespass activity along their properties. The Burlington Northern and Santa Fe Railway Company (BNSF) reported in Black (1999) on efforts to develop and implement a remote monitoring system for rail crossings that would be combined with an in-cab video system to record activity on tracks. These systems would record



Coastal Rail Trail. The trail is proposed to be located across the track from the station. Carlsbad, CA



locations using Global Positioning System (GPS) technology and record the dynamics of the train (braking, whistles, lights) to develop information about trespassing. Such technology has application in the monitoring of trespass activity along RWT corridors.

BNSF also has been active with local and State governments in an effort to control trespass activity through the establishment of a Trespasser Abatement Program of active security intervention and a Safety Assurance and Compliance Program (SACP) that emphasizes efforts with local communities to educate citizens of the risks and consequences of trespassing on railroad tracks. SACP is a program developed and monitored by FRA to address various safety issues in partnership with railroad companies.

A significant effort to study and apply lessons from trespass injuries is presented in a study from the Centers for Disease Control (1999), *Mortality and Morbidity Weekly Report*, "Injuries Among Railroad Trespassers in Georgia, 1990-1996." This report summarizes a study of fatal and nonfatal injuries to railroad trespassers in Georgia from 1990 through 1996. The 17 railroad companies operating in Georgia, as well as other sources, provided trespasser injury data.

This research found that most injuries to railroad trespassers involved 20 to 49-year-old men, many of whom were intoxicated. Most trespassers either were walking or socializing near the tracks at the time of injury. In many incidents, trespassers did not hear the train horn or misjudged the speed or location of the train. This latter problem appears to be more common when a train is approaching on one track in multiple-track territory.

Although the number of deaths from motor vehicle collisions with trains at highway-rail crossings has decreased, trespasser deaths have increased. The decline in deaths at highway-rail crossings is a result of multiple factors such as education efforts and engineering changes. Efforts to prevent trespasser deaths have been focused on public education and awareness and law enforcement. However, the target audiences, which vary in composition from region to region, are difficult to reach.

For RWT analyses, planners should strive to determine what types of trespassers are likely to be involved; what types of injuries can be expected; which railroad properties, operating characteristics and locations (urban or rural settings) are at high risk; how the incidents can be mitigated; and what types of actions and technologies the trail design can employ to enhance the safety of RWTs.

### **International RWT Research**

Several other countries, including Switzerland, Denmark, Canada, and Australia, have extensive experience in the development of RWTs. However, researchers were unable to locate specific RWT-related studies in these countries. Instead, researchers commissioned a summary of Western Australian RWTs (specifically in Perth), *Rails with Trails: The Western Australian Experience*, Maher (2000) gathered brochures and other RWT promotional literature through surveys of Swiss and Danish trail representatives and gained access to ongoing dialogue and research being conducted by the Canadian Pacific Railways. Researchers sent information requests to all the major European railway companies and received few substantive replies.





The BLS-Lötschberg Railway produces a series of brochures promoting the BLS-Lötschberg Railway Trail. *Kander Valley, Switzerland*

#### Switzerland

RWTS are very popular in Switzerland, where there are famous hiking trails along the Gotthard and Lötschberg railroads. All of Switzerland's nine new national bicycle routes start and end at train stations. Swiss Federal Railways is a member of the Foundation Bike Country Switzerland and promotes the benefits of combining bicycles and public transport. For their adjacent BLS-Adventure Trail, the BLS-Lötschberg Railway produces a series of brochures that provides a point-by-point historic tour of all the features of the railway. Other railroads that have adjacent trails include the federally-owned Swiss Federal Railways and the privately owned Rhaetian Railways.

#### Canada

No formal tally of Canadian RWTs currently exists, although Transport Canada reports that hundreds of RWT kilometers probably exist. In response to a growing number of requests for RWTs, the Canadian Pacific Railway (CPR) Police Service Community Services Unit is undergoing an internal discussion about their policies and practices. The CPR has collected data about such issues as trespassing, accidents, vandalism, and liability through a survey of various field offices, many of which have experience with RWTs. In *Problem Analysis Report: Recreational Trail Use* (Law, 1999), the CPR lays out a series of issues to be discussed as part of their effort to develop a companywide policy on RWTs.

#### Western Australia

Perth, Western Australia, has 10 years of experience with the design and construction of RWTs. Perth has more kilometers of RWTs than any other city in Australia. The first length of RWT in Perth was constructed in 1989. The 500 m (1640 ft) section was regarded as a trial. Since 1989, the Western Australian Government has completed an additional 3 km (1.9 mi), and is designing many more.



Reseau Verte along Canadian Pacific Railway mainline. *Montreal, Quebec, Canada*



A section of RWT in Perth illustrates typical design and construction parameters, including 3 m (10 ft) wide asphalt path, set back from the adjacent rail line, and a 1.8 m (6 ft) chain mesh fence with three strands of barbed wire. *Perth, Australia*

Westrail, the railway department of the Western Australian Government has had many concerns about the construction of these RWTs. As a result, Westrail and Main Roads (the government's road construction department) entered into an agreement to ensure paths can be constructed with no impact on railway operations and safety. This agreement specifies that RWTs will be constructed adjacent to all suburban lines. The RWTs will consist of a 3 m (10 ft) wide asphalt path, set back a minimum 5.5 m (18 ft) from the track centerline, separated by a 1.8 m (6 ft) high chain mesh fence with three strands of barbed wire.