APPENDIX H

Rails-with-Trails Supporting Documents

A Survey of Trails Along Active Rail Lines

SAN FRANCISCO BAY TRAIL (PHOTO: RAILS-TO-TRAILS CONSERVANCY)

Rails-to-Trails Conservancy

Rails-to-Trails Conservancy (RTC) serves as the national voice for more than 100,000 members and supporters. We've help develop more than 15,000 miles of rail-trail throughout the country, and thousands of miles of potential rail-trails waiting to be built. We have supported the tremendous growth and development of rail-trails since opening our doors on February 1, 1986, and we remain dedicated to the creation of a nationwide network of trails and connecting corridors. Further, RTC is committed to enhancing the health of America's environment, transportation, economy, neighborhoods and people—ensuring a better future made possible by trails and the connections they inspire.

rails·to·trails
conservancy

NOVEMBER 2009

RAILS-TO-TRAILS SURVEY ALONG ACTIVE RAIL LINES

The following report has been extracted from the original report and does not contain any of the original images. The original report can be viewed on the Rails to Trails conservancy website at this link: http://www.railstotrails.org/resources/documents/ourWork/west/California_RWT_Survey.pdf

EXECUTIVE SUMMARY

Every day, thousands of Californians safely use and enjoy trails located along active rail lines. Because these trails offer access to transit, transportation options to important destinations, and recreational and exercise opportunities, rail-with-trail projects are booming in California. Railroads and transit agencies have mixed responses to the trails, but in some cases they have been embraced to increase ridership and reduce trespassing across the tracks. Rail-with-trails projects are a valuable tool to improve the transportation network for bicycles and pedestrians, while at the same time improving access to open space and providing recreation opportunities. ROSE CANYON BIKE PATH, SAN DIEGO (PHOTO: RAILS-TO-TRAILS CONSERVANCY)

Purpose: This report gives a California-focused update to the November 2000 Rails-with-Trails report published by Rails-to-Trails Conservancy. It is intended to help trail project advocates by providing information gleaned from Rails-with-Trails, existing projects and specific examples of design. For more general information on rail-with-trail projects, the November 2000 report can give additional case studies and figures from a nationwide perspective. Rails-with-Trails is easily accessed on the RTC website: www.railstotrails.org/resources/documents/resource_docs/Rails-with-trails%20Report%20reprint_1-06_lr.pdf

In 2002, the U.S. Department of Transportation also published an exhaustive report on rail-with-trail projects that includes design, planning and safety guidance. It is available on their website: www.fhwa.dot.gov/environment/rectrails/rwt/toc.htm

CALIFORNIA RAILS-WITH-TRAILS 2

GROWTH: The growth and popularity of rails-with-trails appears to parallel the growth of traditional rail-trails. This report analyzes 21 existing rail-with-trail projects—up from the seven California rails-with-trails that were identified in Rails-to-Trails Conservancy's 2000 report. At least another five rails-with-trails are being planned.

DUAL BENEFIT: Constructing a trail along an active railroad doubles the value a community derives from the rail corridor and provides citizens with an extra transportation choice. In many places it is difficult to find land on which trails can be built, so using an existing rail corridor can be a good option. In some cases, trails support railways by providing enhanced access for transit riders to stations.

SAFETY: Despite fears that rails-with-trails expose users to greater danger by their proximity to active rail lines, rails-with-trails have been shown to be just as safe as other trails. Our survey of trails found no incidents in California between a trail user and a train. In fact, using a rail-with-trail may well be significantly safer than walking or cycling next to a busy main road, and it may serve to keep people from walking on active rail tracks. Developed trails next to active rail lines funnel trail users to controlled crossing points or new tunnels and bridges across the rail line. Barriers and fences constructed as a part of trail projects can provide separation from the rail lines and discourage trespassing onto the active lines. Designs to reduce potential conflicts are especially important in coastal areas where access across the tracks is highly desirable.

RANGE OF DESIGNS: Rails-with-trails in California are operating successfully under a wide variety of conditions. Some are very close to rail tracks, and others farther away. Some use extensive separating fences or barriers. Some are next to high-speed, high-frequency train services; others are on industrial branch lines or tourist railroads with slower trains operating only a few times per week. Some have at-grade crossings while others use underpasses or overpasses. These successful projects shared two common threads; the involvement of stakeholders and the railroad throughout the process, and designing to maximize safety and function.

RAILROADS: Railroad companies are understandably cautious of such projects, and the majority of trail managers reported that adjacent railroads had mixed feelings or did not initially want to discuss the possibility of a trail along the active line. However, 25 percent of the responding trail managers described the attitude of the railroad involved with their trail as supportive, positive or good.

LIABILITY: The survey revealed the vast majority of rails-with-trails are insured by existing city or transit district insurance coverage in a similar manner to other trails. An increasing number of railroad companies are requiring trail managers to indemnify them against liability. The report found one claim made against trail managing agencies due to increased noise of train horns blowing at new at-grade crossings. According to the survey results, no claims were made against railroad companies.

INTRODUCTION

California offers a wonderful climate, a growing public transit system and a variety of urban and town centers that make trails along active rail corridors an excellent option for commuting, transit access and recreation. Rail corridors can be attractive sites for trails because they often provide a direct connection between popular community locations, such as downtown districts and residential areas. At a time when demand for trails is increasing, finding land for them can be difficult. Placing trails alongside active rail corridors can be an excellent method of securing land for safe, popular and effective trail development.

Rails-with-trails are multi-use trails along rail lines that are still active. In recognition of the growing popularity and use of rails-with-trails, this report presents findings gathered from a survey and interviews of managers of 18 California rails-with-trails. An additional three rails-with-trails were included with partial data that will be completed when the trail managers give additional information. Our intention is to provide all stakeholders considering rails-with-trails projects with information so that decisions are based as much as possible on objective facts.

WHO CAN USE THIS REPORT?

This report is designed to be of assistance primarily to trail planners, advocates and managers. By clearly laying out the California rails-with-trails experience, the report is designed to help answer questions such as:

- Are rails-with-trails safe?
- Will a rail-with-trail work in our community?
- How do we design our rail-with-trail to make it safe and effective?
- How can we work cooperatively with a railroad company?
- How do we handle liability issues?
- Who has experience with different aspects of rails-with-trails?

The report can also be useful to the railway industry, elected officials, federal, state and local transport officials, consultants, planning departments and anyone interested in the rail-with-trail concept.

GROWTH OF RAILS-WITH-TRAILS

California came late to the rail-trail movement, but momentum is building rapidly to build a network of trails that helps the population access public transit and find recreational opportunities in urban areas.

There are currently at least 21 open rails-with-trails with 60 miles of trail, up from seven rail-with-trails and 11.4 miles of trail in 2000, a fivefold increase in mileage. At least five more rails-with-trails are known to be in various stages of development, with major projects such as the Coastal and Inland Rail Trails in San Diego County, the Coastal Rail Trail in Santa Cruz County, and the SMART corridor in Sonoma and Marin proposed to add considerable mileage to trail networks in those areas. Not all rails-with-trails run along active rail lines for their total length. Of the 60 miles of rails-with-trails in California, 45 miles lie adjacent to an active line.

Rails-with-trails appear to be as popular as any other type of multi-use trail. The eight rails-with-trails with usage estimates reported a total annual patronage of 406,000 visits.

Interestingly, the longest rail-with-trail is actually adjacent to a bus rapid transit line that operates similar to light rail. Because the characteristics of the busway are similar to a rail line, we chose to include the information in this report.

Rails-with-trails projects vary greatly in length, separation from the rail line and usage, just as the active rail lines they parallel vary greatly in traffic and speed.

DUAL BENEFIT

Once constructed, rails-with-trails offer similar benefits to trail users and the general community as other types of trails. They are safe places for walking, jogging, cycling and other forms of recreation or human-powered travel, and they provide recreation, commuter and utility links between and within communities. In California coastal communities, they can attract tourist use and steer those seeking beach access to controlled crossing points. Rails-with-trails also make efficient use of rail corridors by providing more transportation choices for the community. In many places, particularly urbanized areas, it is increasingly difficult to create a contiguous corridor on which trails can be built, so utilizing an existing rail line can be the best option.

For example, the 2.5-mile Folsom Parkway Trail in Folsom was developed with the specific goal of making the best use of the existing transport corridor. The trail is helping to boost rail ridership as train commuters use the trail to cycle or walk to the stations for their commute to Sacramento. The trail project also reduced costs for the rail construction by helping fund relocation of an existing gas line, and the transit district included the trail in their construction of the Glenn Road station.

LOGICAL LINKS

Rail corridors were developed to form links between many of the places that cyclists, walkers and other trail users want to go. These include links between downtowns and residential areas, often running along attractive waterfronts or serving historical tourist destinations.

Just like unused train lines, active lines have bridges and culverts designed to help trains avoid at-grade road crossings. Trails can sometimes take advantage of these, improving the safety for trail users by keeping them away from road crossings and making the trail route smoother, more direct and attractive.

LAND OWNERSHIP

Because the rail lines adjacent to rails-with-trails have various uses, the ownership of the corridors also varies. Three corridors are owned by cities, eight by transit districts for commuter rail, light rail or bus rapid transit, and 10 are owned by railroad companies. Most city-owned corridors are used for excursion trains.

EASEMENTS

The survey showed that 10 of the rails-with-trails projects were granted an easement from the corridor owner. Seven did not need an easement, either because the corridor owner also manages the trail or because the trail is just outside the railroad property on an adjacent right-of-way. The San Clemente Pedestrian Beach Trail did not get an easement but did enter into a license agreement similar to a lease with the State Lands Commission. Easement information was unknown for four of the trails.

SAFETY

Safety is the most important aspect of developing any rail-trail, whether along an operating railroad or not. The good news is that rails-with-trails have been shown to be just as safe as other trails. Every day, thousands of people across the United States safely use existing rails-with-trails. Fears that more trail users would be severely injured due to the proximity of moving trains have never been realized.

UNDERSTANDING THE RAILROAD

It is not surprising that railroads are so concerned about safety and liability. The rail industry is strongly committed to improving the safety of its operations and to keeping people off railroad tracks. It spends millions of dollars each year on this effort through Operation Lifesaver and other campaigns.

Apart from the obvious desire to preserve life, the rail industry is concerned with the trauma that train incidents can cause to train drivers and other staff, the possibility of vandalism of railroad property which may be expensive to repair or create a threat to safety, and the threat of litigation.

Trails are sometimes seen as attracting additional people and problems to the corridor, directly conflicting with railroad maintenance, operations and safety.

TRAIN-TRAIL USER CONFLICTS

California trail managers reported that no incidents with trains and trail users have occurred on rails-with-trails. Previous nationwide studies in 2000, 2002 and 2005 found two incidents that were not directly trail related, but did occur near rail-with-trail projects. A bicyclist was injured in Illinois on an adjacent preexisting road/rail crossing when the bicyclist ignored warning bells and flashing lights and rode around a lowered crossing gate. Another injury occurred in Alaska when a young person crossed a trail from a residential area to “hop” a slow-moving train. No other trail-related train accidents have been reported nationwide.

Contrast the absence of conflicts on rail-with-trail corridors to injuries and deaths sustained on rail corridors without active trails. The 2002 U.S. Department of Transportation and Alta Planning Rails-with-Trails: Lessons Learned study reported that from 1995 to 2002 the number of trespass fatalities had reached approximately 500 per year, exceeding highway-rail crossing deaths. Per the report, “trespasser fatalities represent the greatest loss of life associated with railroad operations.”

Rails-with-trails projects have the potential to reduce train and trail user conflicts by guiding trail users to controlled crossings and designated access points. For example, in the case of the new San Clemente Pedestrian Beach Trail, the railroad operator sees the trail as a safety improvement after initially having concerns. The trail constructed a tunnel under the tracks at one of the points that had the most pedestrian traffic, but planners also added new at-grade crossings. San Clemente reported that there were incidents prior to the trail construction, but none since. Similarly, the San Luis Obispo Railroad Safety Trail provided a new pedestrian and bicycle bridge over the active rail line where trespassing was common and constructed fences in the vicinity to funnel trail users to the bridge.

There were several incidents unrelated to the trail reported on the Metro Orange Line busway where cars ran red lights and collided with the bus rapid transit vehicles used on the Orange Line. Details can be found in an LA Times article: http://articles.latimes.com/2005/nov/03/local/me-orange3. For cyclists using the bikeway, the survey found that measures were taken to warn riders of intersections through a striping plan, “Signal Ahead” signs, and curves in the path to slow riders and lead them to wheelchair ramps for crossing.

RELATIVE SAFETY OF ROAD AND RAIL

Opponents of rails-with-trails have said that introducing people to active railroad corridors will reduce the safety of the corridor. However, questions on the safety of active railroad corridors are only relevant in comparison with existing bicycle and pedestrian safety on roadways and with current incident levels on rail lines without adjacent trails.

Rails-with-trails can be safer than trails next to roads. “In the last 15 years, more than 76,000 Americans have been killed while crossing or walking along a street in their community,” according to the 2009 Dangerous by Design report by Transportation for America and the Surface Transportation Policy Partnership. Trails separated from roads can provide a safer option. Even with an active rail line near the trail, the exposure from a track carrying ten to twenty trains per day is much less than a road carrying thousands of vehicles per day.

SAFE DESIGNS

Trail managers can do a great deal to ensure that their trail is designed, operated and maintained to be as safe as possible. Each of the trail managers surveyed for this study faced a variety of safety challenges that they have solved.

Key safety design factors include:

- Providing adequate distance between track and trail. The separation between track and trail varied widely and averaged 45 feet. Measurements are from the centerline of the track to the nearest edge of the trail. Trail planners strive to maximize the setbacks of the trail from the track, but in some cases geography and right of way limit the available space. The San Clemente Beach trail, Folsom Parkway, Sacramento River Parkway, Inland Rail Trail, Santa Maria Valley Railroad trail, and Martin Luther King Promenade all have segments that are within 20 feet of the track centerline.
- Providing safe fencing, barriers or grade separation between track and trail where necessary. The survey found 15 of the 21 rails-with-trails have installed some kind of barrier between the rails and the trail. Barriers used include vegetation, grade separation, fences, ditches and cement walls. Crossings are at-grade, tunnels or overpasses. Four trails did not have a barrier, and two did not have information.
- Designing safe rail crossings, and creating enough of them at convenient locations to serve local uses.
- Installing adequate trail-user warning signs.

LIABILITY ISSUES

While liability is a vitally important issue, building a trail along an active railroad does not, in itself, expose the trail manager to unacceptable risk of liability. In other words, the concept of rails-with-trails is not an inherently negligent design. As is the case with most trails, public trail managers and private landowners have some liability protection in many states due to recreational use statutes. These statutes reduce the liability of landowners and managers who provide free public access on their land for recreational uses such as trails.

Railroads have, for many years, had some protection against liability for injuries on their tracks due to the impracticality of fencing many thousands of miles of railway, some of which have been in place for more than a century. However, railroads are naturally interested in keeping their liability to a minimum. In some cases the mere threat of possible legal action, and the amount of the railroad's time and effort that may be needed to resolve even frivolous suits, will be enough to deter rail companies—particularly small companies—from involvement in rail-with-trail.

INSURANCE POLICIES

All of the trail managers responded that the trails are covered by existing insurance policies that cover the city, open space or transit entity that operates the trail.

CLAIMS AGAINST TRAIL MANAGERS

Of the 18 trail managers interviewed for this report, one has a current claim, but it is not safety related. San Clemente is dealing with a current claim from homeowners regarding train horn noise due to the new at-grade pedestrian crossings constructed as a part of the trail project. The city is testing "wayside horns" and a Safety/Quiet Zone as possible solutions to reduce the noise and settle the claim.

INDEMNIFICATION

Indemnification of the railroad in California rail-with-trail projects varied greatly. In many cases, the trail manager did not know if they were required to indemnify the railroad, or it was not applicable because the trail is outside the rail right-of-way (such as in an adjacent road right-of-way owned by the city). Most trails that were actually in the rail right-of-way were required to indemnify the railroad, with the exception of Folsom Parkway and the city-owned Sacramento River Parkway. Of the eight trails studied where indemnification would be applicable, seven (88 percent) were required to release the corridor's owner from liability for incidents on the trail. This percentage is an increase from previous nationwide studies which had figures of 17 percent of trails in 1996 and 26 percent in 2000.

This result may be because the trails studied previously were those that were easiest for the trail managers to develop, or because rail operators are becoming more concerned about their liability. Trail managers will need to negotiate the indemnity with the railroad as a part of the trail development process. Offering to incorporate the trail into the city, county or state umbrella policy can be an effective way to alleviate railways' liability concerns.

RISK MANAGEMENT

The key to minimizing exposure to liability for rails-with-trails is the same as for other types of trails. The trail should be designed by professionals to accepted state and national standards, and the trail must be systematically maintained and managed with clear, well-documented records.

The manager of any trail, especially a rail-with-trail, should obtain legal advice on their exposure to liability.

The three main types of scenarios likely to expose trail managers to potential liability are:

- Injuries caused by trail defects;
- Injuries caused by conditions on adjacent property including the active railroad;
- Injuries resulting from conflicts among users or where a trail crosses a road or railroad track.
- Special care should be taken to ensure that crossings are properly designed with the correct signage and that any barriers designed to improve safety are well-maintained. (See the AASHTO Guide for the Design of Bicycle Facilities.)

WORKING WITH RAILROADS

The California survey shows that while railroad operators are concerned about any proposal that might bring more people into contact with their rail lines, many also are supportive of the concept of rail-with-trail, as well as the benefits trails can bring to the community and the railroad company.

When developing a rail-with-trail, including both parallel rail lines and rail crossings, trail developers must consider the safety of trail users with respect to active rail lines. Trail managers should bring key stakeholders—including the railroad operator, railroad customers, government leaders and trail users—together early in the trail-development process. Coordinating efforts guided by best practices as outlined by the Federal Highway Administration's rails-with-trails study will ensure that safety elements are an integral part of the trail's master plan.

CHARACTERISTICS OF ADJACENT RAILROADS

Rails-with-trails run along a wide variety of active rail lines with different speeds, frequency and types of trains, ranging from bus rapid transit to slower-speed excursion trains to high-speed transit and freight trains. The charts below reflect this variability in the percentages of trails next to the types of rail traffic.

DESIGN ISSUES

Trail managers noted several aspects of the trail designs that drastically increased maintenance costs or had to be replaced within a few years of the trails opening.

The city of Carlsbad included bollard lights along their trail that have become a target of repeated vandalism. The three-foot-tall bollard lights are just off the asphalt trail in a two–foot-wide decomposed granite area. The lights have repeatedly been hit with baseball bats and have caused most of the $80,000 to $90,000 costs of maintenance that the city is absorbing. The railroad operator would not allow taller lights, fearing they would distract the train engineers. For future phases the city will request taller lighting with shielding to prevent any light issues for the railroad operator.

Carlsbad also has recurring issues with people cutting through the new welded-wire fence in areas where they were accustomed to crossing the tracks for beach access. The illegal crossings have caused increased tension with the railroad operator.

In another case, the Metro Orange Line in Los Angeles was originally landscaped with dense greenery and shrubs, which led to transient use, vandalism and complaints from neighbors. The landscaping was then changed out and is now being routinely maintained by a subcontractor.

The Metro Orange Line in Los Angeles also faced safety concerns with bicycle speeds at street crossings. They solved the problem with a slurve, where the bike path encounters a sharp curve and diagonal curb cut at the crossing. This design reduces the speed of the approaching bicyclists, forcing them to acknowledge the traffic signals and making them more visible to cars. A short film spotlighting the trail can be found at: www.streetfilms.org/archives/las-orange-line-bus-rapid-transit-plus-bike-path/

Most of the trails cited additional permitting and environmental issues that needed to be worked through, in some cases with the Public Utilities Commission, before the trail could be developed. These extra steps were especially common along the coast, where rail lines run across inlets, lagoons and rare habitat areas.

TRAIL FUNDING

Similar to other transportation projects, trail funding is a long and complex process. Rails-with-trails projects use a variety of sources to fund planning and construction, including government and private sources. Half of the trails surveyed used multiple sources of funding, with seven using federal, state and local sources. Many jurisdictions in California have passed local sales tax measures to raise transportation funds that are used to match state and federal transportation and parks grants. These projects may include new grade-separated crossing of the rail tracks, new bridges, environmental mitigation measures and complicated engineering solutions that tend to be more expensive than local funds can support independently. Three of the surveyed trails were built with only local funding sources; these are commonly conditioned as a part of an adjacent development project or funded through impact fees.

Maintenance funding came exclusively through the cities in which the trails are located, and funding levels varied wildly depending on the landscaping and amenities that are offered along the corridor. When new trails are planned, a thorough maintenance plan and funding sources should be prepared to ensure that the trails are safe, attractive and useful additions to the communities they serve.

ADDITIONAL RESOURCES

- “Rails–with-Trails: Design, Management, and Operating Characteristics of 61 Trails Along Active Rail Lines” (Rails-to-Trails Conservancy, 2000). www.railstotrails.org/resources/documents/resource_docs/Rails-with-trails%20Report%20reprint_1-06_lr.pdf
- “Rails-with-trails: Lessons Learned” (U.S. Department of Transportation and Alta Planning, 2002). www.fhwa.dot.gov/environment/rectrails/rwt/toc.htm
- “Rails-with-trails: A Preliminary Assessment of Safety and Grade Crossings” (Rails-to-Trails Conservancy, 2005). www.railstotrails.org/resources/documents/resource_docs/RwT_Grade_Crossings_Report_final_lr.pdf
- “Guide for the Development of Bicycle Facilities” (American Association of State Highway and Transportation Officials, 1999). http://safety.fhwa.dot.gov/ped_bike/docs/b_aashtobik.pdf
- “Manual on Uniform Traffic Control Devices” (U.S. Department of Transportation, 2003). http://mutcd.fhwa.dot.gov/ Rails-to-trails Survey along active rail lines

U.S. Department
of Transportation

Federal Highway Administration

Federal Railroad Administration

National Highway Traffic Safety Administration

Federal Transit Administration

Rails-with-Trails: Lessons Learned

Literature Review, Current Practices, Conclusions

August 2002

FTA-MA-26-0052-04-1

The following report has been extracted from the original report and does not contain any of the original images. The original report can be viewed on the Rails to Trails conservancy website at this link: http://www.railstotrails.org/resources/documents/ourWork/west/California_RWT_Survey.pdf

U.S. DEPARTMENT OF TRANSPORTATION RAILS-TO-TRAILS LESSONS LEARNED

The following executive summary has been extracted from the original report and is not in the original formatting, nor does ot contain any of the original images. The original report can be viewed on the U.S. Department of Transportation website at this link:http://www.fhwa.dot.gov/environment/recreational_trails/publications/rwt/page00.cfm

EXECUTIVE SUMMARY

This report offers conclusions about the lessons learned in the development, construction, and operation of "rails-with-trails" so that railroad companies, trail developers, and others can benefit from the history of trails in existence today. "Rail-with-trail" (RWT) describes any shared use path or trail located on or directly adjacent to an active railroad corridor. About 65 RWTs encompass 385 km (239 mi) in 30 States today. These trails are located adjacent to active rail lines ranging from a few slow-moving short-haul freight trains weekly, to high-frequency Amtrak trains traveling as fast as 225 km/h (140 mi/h). Dozens of RWTs are proposed or planned. While most are located on public lands leased to private railroads, many are on privately owned railroad property. Hundreds of kilometers of RWTs traverse Western Australia, Canada, and Europe. RWT advocates and railroad company representatives often offer contrasting viewpoints. Trail planners view railroad property, often located in scenic areas with favorable topography, as a better alternative than bike lanes on roadways. They note that legal protections of varying degrees exist in all States, and that a litany of successful RWTs should provide comfort. Railroads generally oppose RWTs for the following business reasons: the trails are not related to railroad operations and generally do not generate revenue for the railroads; railroad rights-of-way may be needed for future enhancements to system capacity; poor design or maintenance of trails could lead to increased trespassing, with consequent increases in injuries and deaths; narrowing the railroad's portion of the right-of-way drives up the cost of maintaining track and structures (includingcomplicating safety protection for roadway workers); and significant new populations of pedestrians close to the active track structure may result in additional stress on train crews seeking to ensure the safety of train movements. Railroad company representatives respond to assurances of legal protections by noting that the court system has not yet tested the lease and/or use agreements for existing RWTs. Railroads have borne the burden of litigation for many incidents on their property, even for crashes with at-fault trespassers or automobile drivers who ignored obvious warning systems. Further, they note that the railroad may be determined by civil courts to owe a higher duty of care to trail users than to trespassers, particularly at new, designated crossings.

Policy officials at the U.S. Department of Transportation's Federal Railroad Administration (FRA) have shared the railroads' public safety concerns. They also have pointed out that, for certain main lines, creation of a trail, under circumstances that could foreclose adding additional main line tracks or passing sidings to increase capacity, could result in a constriction of future freight rail service across the Nation or dramatically increased cost as a result of less-than-optimum routing. Nationally, railroads carry the highest percentage of freight of any mode on a "tonnage times distance" basis, and–for the bulk commodities they are well suited to handle–they do so at lower cost than trucks in terms of transportation charges, fossil fuel use, and greenhouse emissions. Although most existing service railroads could never replace the flexibility of trucking, the railroads will remain an essential transportation provider as the economy continues to grow into the future. In the meantime, public pressure is increasing for railroads to free up space adjacent to rail lines for trail usage, pitting the railroad industry's safety, capacity, and liability concerns against trail proponents' desires to create shared use paths and other trails. This situation gave rise to the need to study the issue of RWTs to determine where they are appropriate, recommend design treatments and management strategies, find ways to reduce liability impacts on the railroad industry, and address other public interest considerations.

RWT DEVELOPMENT PROCESS

The current RWT development process varies from location to location, although common elements exist. Trail advocacy groups and public agencies often identify a desired RWT as part of a bikeway master plan. They then work to secure funding prior to initiating contact with the affected railroad. The railroad agency or company typically lacks an established, accessible review and approval process. While some RWTs move forward quickly (typically those where the trail development agency owns the land), many more are outright rejected or involve a lengthy, contentious process. RWT processes typically take three to ten years from concept to construction.

FEASIBILITY REVIEW

Trail managers should undertake a comprehensive feasibility analysis of proposed RWTs. An RWT feasibility study should describe the setting, relationship to local planning documents, land ownership patterns, railroad activity, and other information necessary to determine feasibility. The study should identify and evaluate multiple alternative alignments, including at least one that is not on the railroad right-of-way, and determine a preferred alignment.

ASSESSING POTENTIAL BENEFITS

Identifying potential benefits to railroad companies is crucial to developing a successful RWT. Such benefits may include the following:

- Reduced liability costs;
- Financial compensation;
- Reduced petty crime, trespassing, dumping, and vandalism;
- Reduced illegal track crossings through channelization of users to grade-separated or well-designed at-grade crossings;
- Increased public awareness o f railroad company service;
- Increased tourism revenue;
- Increased adjacent property values; and
- Improved access to transit for law enforcement and maintenance vehicles.

INVOLVING THE STAKEHOLDERS

Involving the railroad and affected agencies early in the process is a common theme heardfrom surveys and interviews on existing RWTs around the country.

Stakeholders may include:

- Railroad companies, in cluding representatives of real estate, operations, maintenance,and legal departments;
- Railroad customers (businesses that ship by rail or receive shipments by rail that are located on the line segment, such as passenger organizations, transit authorities, and
- State departments of transportation that may have an interest in funding new service on the line–either on the same tracks or on new tracks built within the right-of-way);
- Utility companies, su ch as telephone, cable, water, sewer, electric, and gas;

- Law enforcement officials;
- Other adjacent landowners;
- Trail user groups; an d
- Transportation, pu blic transit, parks and recreation, and health departments.

Stakeholders should be involved through a technical advisory committee or frequent communication via meetings, newsletters, phone calls, and e-mails.

CAPACITY CONSTRAINTS

Privately-owned Class I railroads tend to be reluctant to grant non-rail usage of their rights-of-way because loss of right-of-way width at any given location could reduce the ability of the railroad to add main track and sidings necessary to provide increased capacity and serve customer needs across the breadth of their systems. Freight railroads spent the decades of the 1980s and 1990s reducing excess capacity in order to control costs and survive in a competitive marketplace. This has resulted in concentrating more traffic on fewer lines and reducing the options for reaching given marketsfrom other locations (e.g., there are essentially three corridors to the west coast from the Mississippi).

State departments of transportation and area transit authorities may have long-term plans for new service that could be foreclosed by permanent trail improvements on the particular line. To the extent the full width of the right-of-way may be needed for these purposes (including responding to air quality nonattainment requirements), the significant investments that would be required for a trail to cohabit with an active rail line may not be warranted. It should be noted that the property interest held by railroads at many locations is an easement or similar right subject to an express reversionary interest should the line cease to be used for rail service. In many cases, the purpose for which the railroads hold the easement is to provide for intrastate rail transportation. If a portion of the right-of-way is allocated for trail use, and if this restricts allocation for later railroad demands for increased capacity, that is inconsistent with the purpose of the easement.

LIABILITY

In the context of RWT, liability refers to the obligation of a trail manager or railroad to compensate a person who is harmed through some fault of the trail manager or railroad. Railroads have a number of liability concerns about the intentional location of a trail near or on an active railroad corridor:

- Trail users m ay not be considered trespassers if a railroad permits trail use within a portion of their right-of-way, and thus the railroad would owe a higher duty of care to trail users.
- Incidents of trespassing and injuries to trespassers will occur with greater frequency.
- Trail users m ay be injured by railroad activities, such as falling or protruding objects, hazardous materials, or a derailment.
- Injured trail users might sue railroad companies even if the injury is unrelated to railroad operations, incurring expensive legal costs.

The level of railroad company concern is dependent in part on the class of railroad and the type of operations they perform. The Class I railroads' perceived deep financial pockets make them a frequent target of lawsuits, and they see no financial benefits from RWTs that would offset any increased exposure. Transit and tourist train operators may support RWT projects because they often are quasi-governmental entities, with a mission of attracting people to their service. Finally, locally based short-line operators have less reason to be concerned about future track expansion, and may be inclined toward the potentialfinancial rewards of permitting an RWT project along their rights-of-way.

AVAILABLE LEGAL PROTECTIONS

There is a range of options that can reduce railroad liability exposure. These include the following:

- State-enacted recreational use statutes (RUS) and rails-to-trails statutes. All 50 Stateshave RUSs, which provide protection to landowners who allow the public to use their land for recreational purposes. An injured person must prove the landowner deliberately intended to harm him or her. Additionally, about 20 States have enacted specific laws to clarify, and in some cases, limit, adjacent landowner liability. This can rangefrom protecting adjacent landowners from liability to making the RUS for the State specifically applicable to a rails-to-trails program.
- Property acquisition. Governments under civil law are treated differently from private landowners due to their unique status as sovereign entities. Many States have recently enacted statutes that limit the amounts or kinds of damages recoverable against governments (Isham, 1986). Public agencies considering RWTs should be prepared to identify financial incentives for a railroad to consider. This may be in the form of land transfers, tax breaks from donated land, cash payments, zoning bonuses on other railroad non-operating property, taking over maintenance of the trail right-of-way and structures, and measurably reducing the liability a railroad experiences.
- Easement and license agreements that indemnify the railroad owner against certain or all potential claims. In most cases, the railroad will retain property control, thus the form of legal agreement will be an easement or license agreement that, to the extent permissible under State law, reduces the railroad's liability exposure. Because of the many jurisdictions that have some involvement in an RWT—including the owner of the right-of-way, the operator of the railroad, and the trail manager(s)—the license or easement agreement should identify liability issues and responsible persons through indemnification and assumption of liability provisions.
- Insurance. Railroads may be concerned that trail users might sue them regardless of whether the injuries were related to railroad operations or the proximity of the trail.
- In most instances, the trail management entity should provide or purchase comprehensive liability insurance in an amount sufficient to cover foreseeable railroad liability and legal defense costs.

The research team for this report was unable to find a history of crashes or claims on the existing RWTs. There is only one known case of a specific RWT claim (in Anchorage, Alaska). The railroad was held harmless from any liability for the accident through the terms of its indemnification agreement. Research on other relevant cases has found that the State RUSs and other statutes do hold up in court.

DESIGN

No national standards or guidelines dictate RWT facility design. Guidance must be pieced together from standards related to shared use paths, pedestrian facilities, railroad facilities, and/or roadway crossings of railroad rights-of-way. Useful documents include the Manual on Uniform Traffic Control Devices, the AASHTO Guide for the Development of Bicycle Facilities (1999), Americans with Disabilities Act publications for trails and pedestrian facilities, and numerous FRA documents regarding grade crossing safety and trespass prevention.

Trail designers should work closely with railroad operations and maintenance staff to achieve a suitable RWT design. The research in this report has shown that well-designed RWTs meet the operational needs of railroads, often providing benefits in the form of reduced trespassing and dumping. A poorly designed RWT will compromise safety and function for both trail users and the railroad.

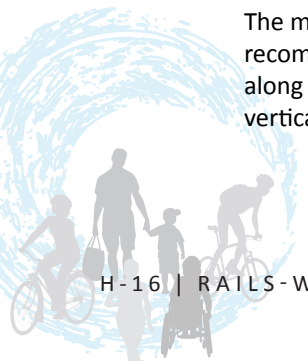
SETBACK DISTANCE

The term "setback" refers to the distance between the paved edge of an RWT and the centerline of the closest active railroad track. Although RWTs currently are operating along train corridors of varying types, speeds, and frequencies, there simply is no consensus on an appropriate setback recommendation. Thus, trail planners should incorporate into the feasibility study an analysis of technical factors relating to setback distance. These should include the following factors:

- Type, sp eed, and frequency of trains in the corridor;
- Separation technique;
- Topography;
- Sight distance;
- Maintenance requirements; and
- Historical problems.

Another determining factor may be corridor ownership. Trails proposed for privately owned property, particularly on Class I railroad property, will have to comply with the railroad's own standards. Trail planners need to be aware that the risk of injury should a train derail will be high, even for slow-moving trains. Discussions about liability assignment need to factor this into consideration. For example, an RWT in a constrained area along a low frequency and speed train could be located as close as 3 m (10 ft) from the track centerline assuming that (a) the agency indemnifies the railroad for all RWT-related incidents, (b) separation (e.g., fencing or a solid barrier) is provided, (c) the railroad has no plans for additional tracks or sidings that would be impacted by the RWT, and (d) the RWT is available to the railroad for routine and emergency access. In contrast, along a high speed line located on private property, the railroad may require 15.2 m (50 ft) or more setback or not allow the trail at all.

Because every case is different, the setback distance should be determined on a case-by-case basis after engineering analysis and liability assumption discussions. The minimum setback distance ranges from 3 m (10 ft) to 7.6 m (25 ft), depending on the circumstances. In many cases, additional setback distance may be recommended. The lower setback ditances may be acceptable to the railroad company or agency, RWT agency, and design team in such cases as constrained areas, along relatively low speed and frequency lines, and in areas with a history of trespassing where a trail might help alleviate a current problem. The presence of vertical separation or techniques such as fencing or walls also may allow for a narrower setback.



SEPARATION

This refers to the treatment of the space between an RWT and the closest active railroad tracks, including fences, vegetation, ditches, and other items. More than 70 percent of existing RWTs utilize fencing and other barriers (vegetation, vertical grade, walls, and/or drainage ditches) for separation from adjacent active railroads and other properties. Fencing style varies considerably from chain link to wire, wrought iron, vinyl, steel picket, and wooden rail. From the trail manager's perspective, fencing is considered a mixed blessing. Installing and maintaining fencing is expensive. Improperly maintained fencing is a higher liability risk than no fencing at all. In all but the most heavily constructed fencing, vandals find ways to cut, climb, or otherwise overcome fences to reach their destinations. Fencing may detract from the aesthetic quality of a trail. To the extent possible, RWT planners should adhere to the railroad company's request or requirements for fencing.

CROSSINGS

The point at which trails cross active tracks is the area of greatest concern to railroads, trail planners, and trail users. When it is necessary to intersect a trail with an active railway, there are three options: an at-grade crossing, a below-grade (underpass) crossing, or an above-grade (overpass) crossing.

AT-GRADE CROSSINGS

With many railroads actively working to close existing at-grade roadway-track crossings, consistent with U.S. Department of Transportation policy, new at-grade crossings will be difficult to obtain. Each trail-rail intersection is unique; most locations will require engineering analysis and consultation with existing design standards and guidelines. Issues that should be considered include the following:

- Train frequency and speed;
- Location of th e crossing;
- Specific geometrics of the site (angle of the crossing, approach grades, sight distance);
- Crossing surface;
- Nighttime illumination; and
- Types of w arning devices (p assive and/or active).

GRADE-SEPARATED CROSSINGS

Overpasses and underpasses are expensive and typically are installed in limited circumstances, such as locations where an at-grade crossing would be extremely dangerous due to frequent and/or high speed trains, limited sight distances, or other conditions. How ever, grade-separated crossings eliminate conflicts at trail-rail crossings by completely separating the trail user from the active rail line. Issues to consider include the following:

- Existing and future railroad operations: Bridges and underpasses must be designed to meet the operational needs of the railroad both in present and future conditions. Trail bridges should be constructed to meet required minimum train clearances and the structural requirements of the rail corridor.
- Safety and security of the facility: Dark, isolated underpasses that are hidden from public view can attract illegal activity. Underpasses should be designed to be as short as possible to increase the amount of light in the underpass.
- Maintenance: The decision to install a bridge or underpass should be made in full consideration of the additional maintenance these facilities require.

OTHER DESIGN ISSUES

A whole host of other issues that must be considered in RWT design include the following:

- RWT-roadway crossings
- Utilities
- Future tracks and sidings
- Trestles and bridges
- Tunnels
- Environmental constraints
- Trailheads and parking areas
- Landscaping
- Drainage
- Lighting
- Signs an d marking

OPERATIONS/MAINTENANCE

Once a RWT is constructed, trail maintenance and operations should seek to minimize impacts on railroad companies and offer a safe and pleasant use experience Representatives from railroad operating, track, and signal departments should be invited for technical discussions and advice in the feasibility analysis phase of an RWT. RWT proponents should consider the maintenance and access needs of the railroad operator in the alignment and design of the RWT. In areas with narrower than 7.6 m (25 ft) setback, the trail likely will be used as a shared maintenance road. In all cases, the railroad should be provided adequate room and means for access to and maintenance of its tracks and other facilities. The feasibility study and easement/license agreement also should identify the designs and costs of any improvements that would become the responsibilit of the RWT agency.

Trail managers should develop a phasing and management plan and program for the RWT. Trail managers should consult with railroad engineering and operating departments to determine the appropriate steps, approvals, permits, designs, and other requirements. They should ensure that the proposed RWT does not increase railroad employee stress or decrease their safety. An education and outreach plan should be part of the trail plan. Trail managers should provide supplemental information through maps, bicycle rental and support services, trail user groups, and other avenues. Trail managers also should develop, in coordination with local law enforcement and the railroad, a security and enforcement plan, and develop and post RWT user regulations.

CONCLUSION

Based on the lessons learned in this study, it is clear that well-designed RWTs can bring numerous benefits to communities and railroads alike. RWTs are not appropriate in every situation, and should be carefully studied through a feasibility analysis. Working closely with railroad companies and other stakeholders is crucial to a successful RWT. Trail proponents need to understand railroad concerns, expansion plans, and operating practices. They also need to assume the liability burden for projects proposed on private railroad property. Limiting new and/or eliminating at-grade trail-rail crossings, setting trails back as far as possible from tracks, and providing physical separation through fencing, vertical distance, vegetation, and/or drainage ditches can help create a well-designed trail. Trail planners need to work closely with railroad agencies and companies to develop strong maintenance and operations plans, and educate the public about the dangers of trespassing on tracks. Railroad companies, for their part, need to understand the community desire to create safe walking and bicycling spaces. They may be able to derive many benefits from RWT projects in terms of reduced trespassing, dumping, and vandalism, as well as financial compensation. Together, trail proponents and railroad companies can help strengthen available legal protections, trespassing laws and enforcement, seek new sources of funding to improve railroad safety, and keep the railroad industry thriving and expanding in its services (freight and passenger).