

# THE American Surveyor

A FOOT IN THE PAST... AN EYE TO THE FUTURE

June 2008

## Receding Railroads

### Alabama CORS

Base station convenience

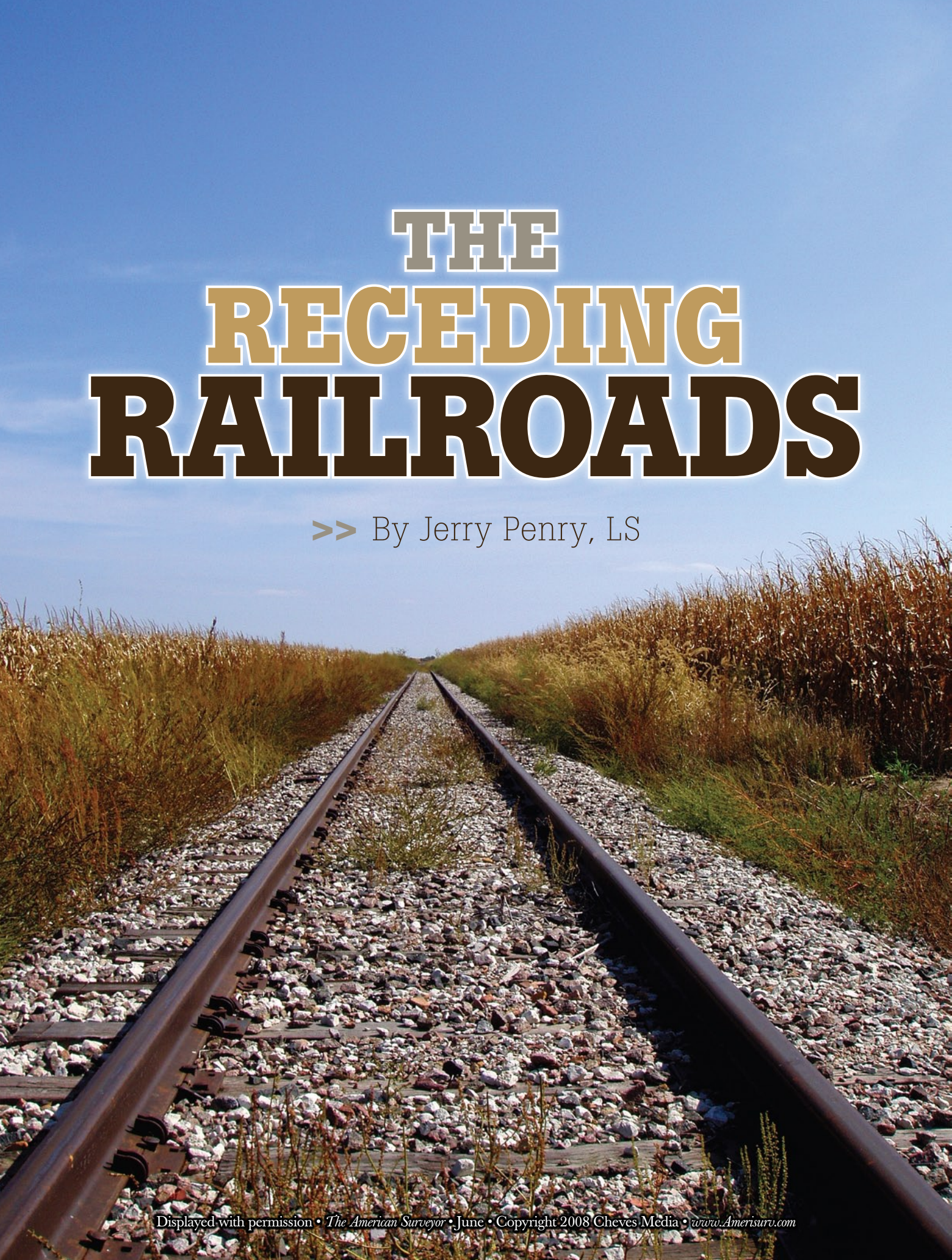
### FEMA Flood Mapping

Akron students layer it on

### Following the Footsteps

What to do when they're invisible?





# THE RECEDING RAILROADS

>> By Jerry Penry, LS





Some early railroad surveyors placed monuments called “T-Rails” (left) that can aid in reconstructing the right-of-way lines. Fences with unusual posts (center) are often a good indication of the railroad’s property lines.

This abandoned railroad (right) is unusual since the valuable rail is often quickly sold for scrap once the trains are discontinued.

By the mid 1920s the railroads in the United States had reached their peak with over 272,000 miles of trackage, not including double tracks, side tracks, or spur lines. The decline of the railroads began almost simultaneously with the advent and momentum gained by the automobile industry, which began to significantly change how goods and people were transported in this nation. The first railroads to be abandoned and removed were generally the branch lines that served small towns where businesses initially served by the railroads found it more feasible to use trucks to make pick-ups or deliveries. Having a product delivered to the door of the business on a tighter schedule became an economic necessity, so continuing the use of trains provided less convenience. The expense of maintaining the lesser-used tracks to those towns became an issue for the railroads as more and more trucks began to carry the goods, so these lines were abandoned.

By the 1960s a declining financial picture caused many railroads that were once competitors to merge together. After the completion of a merger, it was no longer necessary to maintain two sets of tracks in the same general area, so one was typically abandoned. This marked the beginning of the mainline tracks also being abandoned. By the 1980s the railroads began to strategically look where competitors’ tracks were located. If they thought they could abandon a section of track back to a certain point where farmers would still take their products to that location instead of to the competitor’s location, that line was also cut back. All this was done without leaving a physical location indicating where the tracks were once located except for a grade with occasional drainage structures. Since many

railroads were constructed through reversionary easements, the roadbeds were often leveled, the fences removed, and the land was converted to agricultural purposes.

The centerline of the railroad, where it was originally constructed, typically defined the right-of-way and the boundary lines for the adjoining properties. In many instances the recorded deeds or easements were not always written with a clear description that could be used during retracement once the railroad and fences were removed. Calls in the deed descriptions such as “parallel with and 50 feet measured perpendicular to the centerline of the railroad” or “to the railroad right-of-way fence” were once sufficient when the physical objects existed. But once these objects were removed, the boundary lines could not easily be reconstructed by the deed calls alone.

In most cases a surveyor first tries to reestablish where the center of the track was once situated. Next, depending upon whether the railroad acquired the land as fee or through an easement, the right-of-way lines are established from that mathematical centerline. The matter becomes an entirely different issue if the right-of-way of the abandoned railroad has already been surveyed or if there are controlling distances written in the deed. The situation can become further complicated when the easement originally came from one parent tract instead of an equal taking from both sides, which can only be determined through proper research.

When parcels were created that terminated at the right-of-way lines before the railroad was abandoned, the commonly held method of bringing those lines to the center of the abandoned track is to extend them perpendicular to the centerline. This method of apportionment is described in

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The use of GPS has allowed surveyors to quickly define the location of the track structure before removal.

realignments. There was no set rule that required the railroads to maintain their tracks exactly in the center of their right-of-way.

Others issues to consider are the areas where multiple tracks exist. Typically one track controls the location of the original right-of-way. In most cases the oldest or original track established the location of the right-of-way. Most of the curves for the railroads in the United States were constructed as chord-definition simple curves. Spirals were later added to the ends of the simple curves, but the right-of-way lines retained the original simple curve geometry. Some new construction, however, has implemented the spirals into the right-of-way as well.

### Reconstruction Aids

Whether a surveyor decides to establish the location of the abandoned railroad by using evidence of the old centerline, the right-of-way fences, or both, there are certain items that can aid in the reconstruction process. Railroads often constructed their own fences that were distinguishable from those typically established by others. Posts made of concrete, woven wire at the bottom, or

*Brown's Boundary Control and Legal Principals* where the method is to distribute the land located within a vacated public way in such a manner as to give each adjoining land owner an equitable share. This is done by running a line at right angles to the centerline or on a radial line. Some surveyors have debated this method since there are generally no access rights involved with an abandoned railroad like there would be with a riparian boundary and it is therefore thought that property lines should be extended on their same course. Individual state statutes might already be in place that dictate how the land located within an abandoned railroad should be divided.

Aside from the legal and mathematical issues involved with how an abandoned railroad should be determined on paper, the reconstruction of the non-existent

centerline is generally best determined from the information gathered in the field. Some surveyors will argue that the fence holds the greatest weight since it was supposedly constructed by measur-

## Entering railroad property is illegal and can be subject to legal action despite any state "right to trespass" laws in place for surveyors.

ing from the original centerline of the track as constructed. Those familiar with how railroads have operated will know that the structure of the tracks (rails and ties) have often been moved through both intentional and unintentional

the discovery of certain types of obscure barbed wire can all aid in determining the fence location. The Union Pacific Railroad, for example, used concrete fence posts in some locations with the words "R.R. Property Line" imprinted





Bridges such as this one are often all that is left to define the location of the centerline where the track once existed.  
(All photos by Jerry Penry)

into the side. Their standard diagram titled "Right of Way Fence" that was adopted in 1930 also shows a triangular-shaped concrete post with the flat side of the post to be placed on the right-of-way line. If both right-of-way fences are still in place, and a measurement between the two fences agrees with the right-of-way width, it can be a good indication that they were placed on or near the property line. Caution must be observed since fences might have been placed in a location of convenience rather than on the actual property line.

Drainage structures such as bridges and culverts are also useful physical items from which to reconstruct the railroad. Some surveyors will split the width of the bridge while others have determined the centerline from the positions of the opposite spike holes still

visible in the timbers. Splitting the length of a culvert can aid in reconstructing the center of the track, but it would be unlikely that the culvert was placed with both ends being precisely the same distance from the center of the track. Distances to the track might also be found by recorded information on the NGS bench mark datasheets.

One of the best sources of information are the track maps that were made by the railroad companies. Most railroads employed their own surveyors in the early years who gathered data and placed it on the maps. Other charts known as valuation maps were required by the Interstate Commerce Commission for tax purposes. The railroads used valuation maps to help control the purchase and sale of their property and were different from

the engineering maps, but contained important land information such as deeds. Larger scale maps showing more detail were often made for urban areas. Unfortunately these railroad maps can be difficult and costly to obtain. In many cases the railroads have now turned over their maps to private vendors who make them available to surveyors for a fee. The CSX Railroad, for instance, charges \$50 for each valuation map requested from their Internet-based sales site. One issue to consider is that the older railroad maps are only as current as the last revision date. It is not unusual for a railroad to stamp a disclaimer on the map pertaining to its accuracy or adequacy.

Some right-of-way lines and center of tracks were actually monumented by the railroad surveyors. At least one, the



CB&Q Railroad, set vertical sections of rail in the ground and noted them as "T-Rail". It is no longer advisable to drive iron survey markers in the center of the track since railroads are now using a machine known as a ballast-undercutter that lifts up the

rails and ties, picks up the ballast and then screens out the smaller stones. Striking an iron monument driven into the ballast could damage the railroad's maintenance equipment.

Legislation to have the railroads monument the location of the track

before it is removed has remained difficult to enact. Surveyors are now using GPS to more easily record the location of the abandoned tracks. One method that is slowly gaining use is mounting a GPS antenna to the center of a locomotive or hi-rail vehicle. The Union Pacific Railroad is now using a Precision Measuring Vehicle (PMV) which is a sport utility vehicle equipped with cameras, lasers, and GPS that collects a variety of data that is used for their GIS system.

Gaining access to railroad property has become increasingly difficult in the past twenty years. Many surveyors will remember when locating the railroad for a survey was generally not an issue as long as rules of personal safety were observed. Today, after workplace safety rules combined with liability and security concerns, the railroads have greatly restricted any unauthorized person from being on railroad property without proper permission, training and safety equipment. Entering railroad property is illegal and can be subject to legal action despite any state "right to trespass" laws in place for surveyors. The railroads have claimed that the regulations in the Roadway Worker Protection Act, which are federal laws, override any state trespass rights.

Required personal safety apparel can consist of a hard hat, safety glasses, lace-up steel-toed boots with a defined heel, and a safety vest. The possession of weapons of any kind, that may include pocket knives, is prohibited. Wearing of jewelry such as rings can also be prohibited depending upon the particular railroad. Surveyors must now complete specific yearly safety training, be required to display a photo identification card, and may be required to have a railroad flagman present with them at all times.

Despite the encumbrances placed upon surveyors to enter railroad property, defining the location of a railroad before the tracks are removed is a valuable aspect of our profession and may best be accomplished as soon as trains are no longer using the tracks. *A*

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