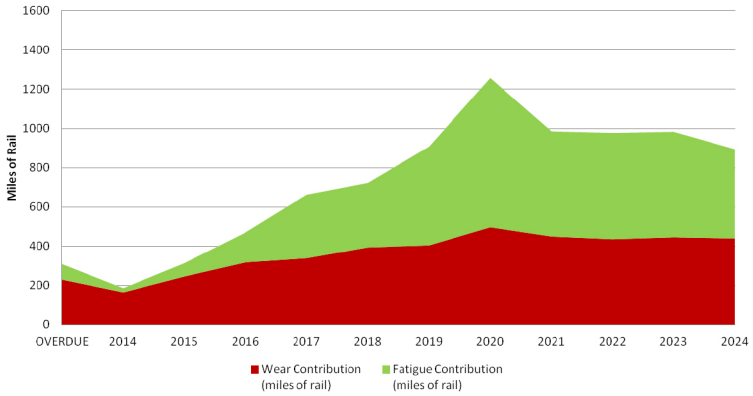
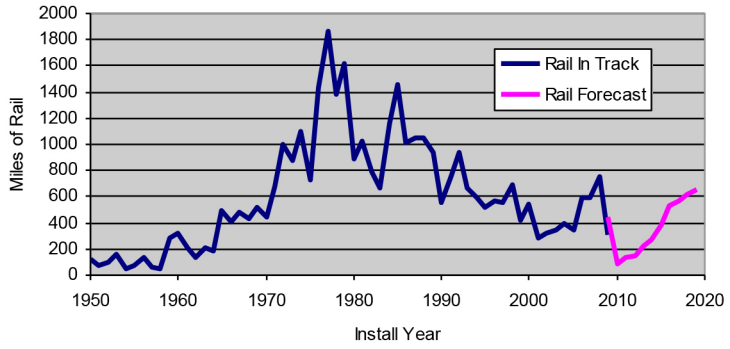



PROTRAN TECHNOLOGY

A Harsco Rail Company

**Benefits:**

- Gain condition knowledge of rail-in-track
- Forecast replacement date for segments of rail
- Aid in capital planning
- Prioritize rail maintenance
- Identify locations of accelerated degradation

RAILLIFE™

# RAIL REPLACEMENT FORECASTING MODEL

**RailLife is an analytic model suite that forecasts when segments of rail will come due for replacement based on both rail wearing and rail fatigue**

RailLife utilizes statistical and empirical techniques for determining rail degradation based on actual inspection information. Two primary models are utilized: the Weibull statistical technique evaluates rail fatigue, and multivariate regression evaluate rail wear. Both methods make use of inspection car information (ultrasonic test results and rail wear measurements) for the engineering analyses.

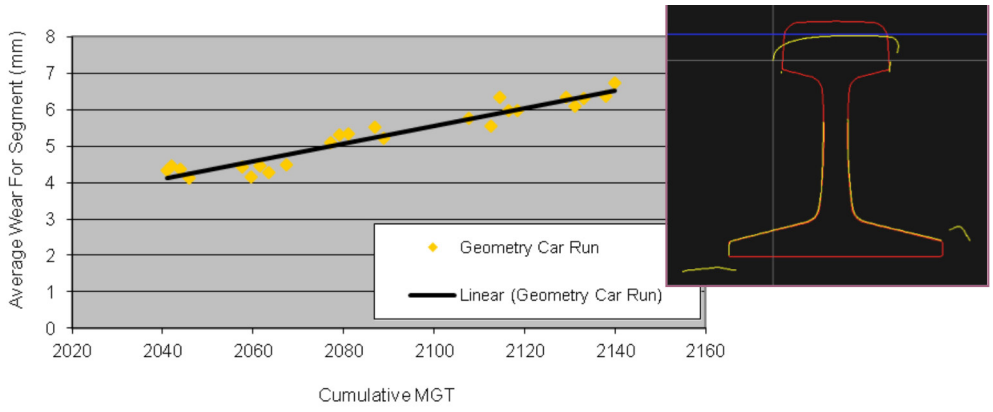
The analysis steps utilize historical railroad data for rail installation (type, date, etc.), traffic (annual / cumulative MGT), geometry (curvature, grade, etc.), and rail degradation (defects and wear). Homogeneous segments of rail are developed and these segments are processed and analyzed using a hierarchy of techniques to determine the controlling failure mechanism and rate of degradation. Based on these rates and predefined maintenance thresholds, a forecast replacement date can be determined for each rail segment.

# RailLife™

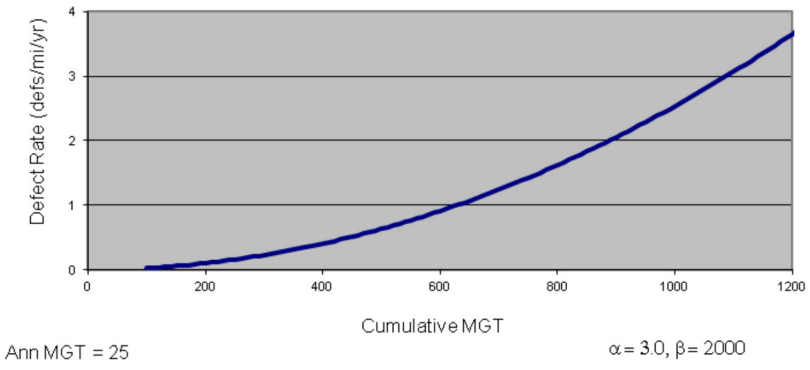
## Rail Replacement Forecast Model

### Features and Benefits:

- Determines wear rates of homogeneous rail segments as a function of MGT
- Forecasts expected remaining life of the rail in MGT and years




- Predicts when rail will reach the rail segment's fatigue limit
- Fatigue analysis methodology
  - Defect history is used to project future defect growth rate
  - Determine tonnage level when defect initiation rate will exceed defined fatigue limit
  - Forecast remaining life in MGT until fatigue limit is reached
  - MGT history/projection are used to forecast rail replacement date




*Defect Intitiative Rate as Cumulative MGT Increases*


PROTRAN TECHNOLOGY

1960 Old Cuthbert Rd., Suite 100
Cherry Hill, NJ 08034
Phone (856) 779-7795
www.protrantechnology.com