



# Vermont Agency of Transportation (VTrans) Automated Route Log System

Session 7.3.2

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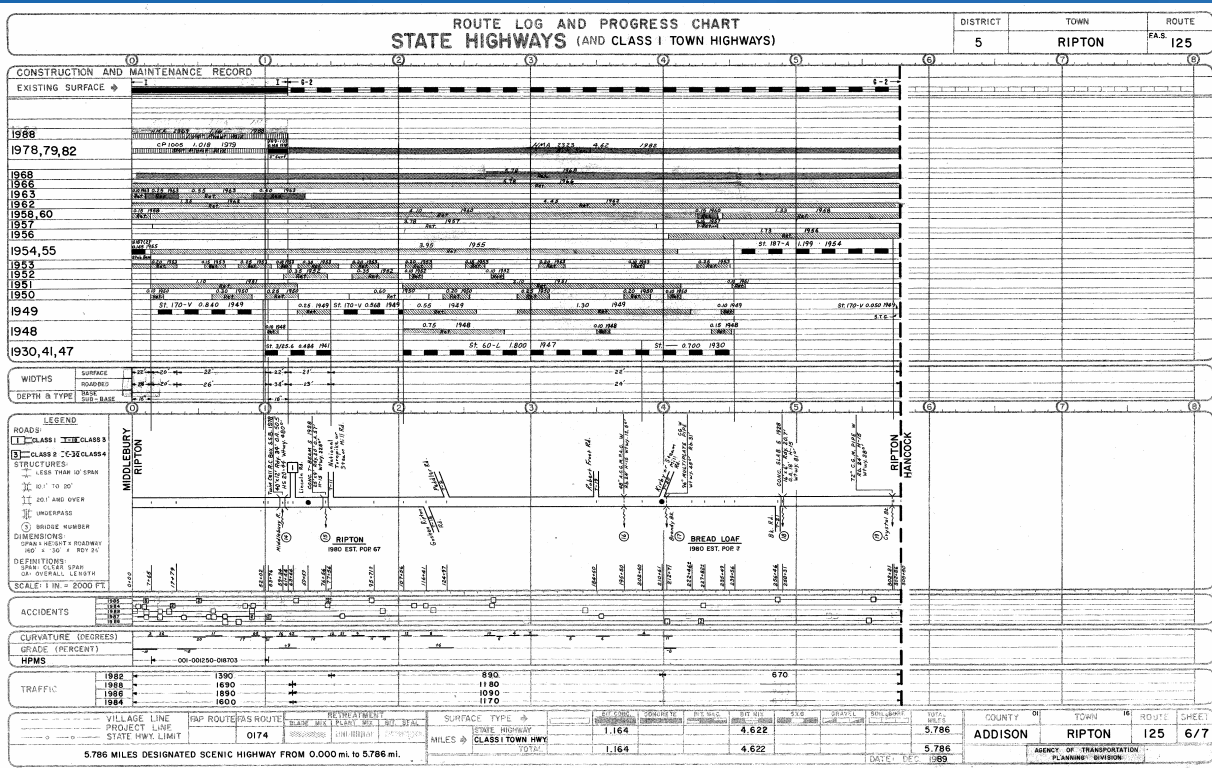
# What are Route Logs?



- ❁ VTrans refers to Straight Line Diagrams (SLDs) as Route Logs.
- ❁ Many DOT's have produced SLD's in the past and still maintain them today in some form.
- ❁ Fundamental source for information about a Route.
- ❁ Very functional way to present and interpret dissimilar data sharing the same physical location in a linear system.



# Sample Route Log

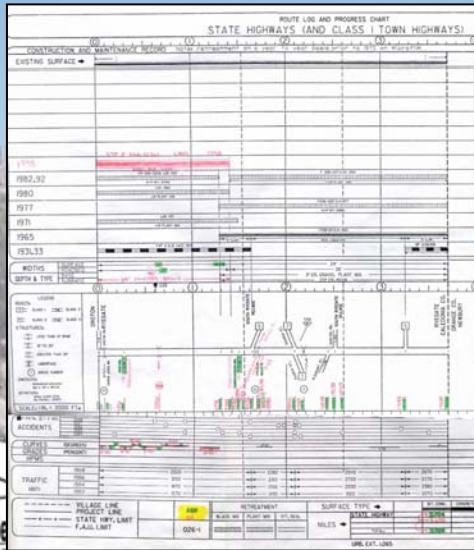


- ✿ Project Information
- ✿ Traffic Data
- ✿ Accidents - 5 Years
- ✿ Surface Type & Depths
- ✿ Widths
- ✿ Curves
- ✿ Grades
- ✿ Route Detail
- ✿ Structures
- ✿ Intersecting Roads
- ✿ Railroad Crossings
- ✿ HPMS Sections
- ✿ Traffic Counter Locations





# Route Logs at VTrans



## ✿ 1950's

- *The first Logs were drawn by hand*
- *Developed during the building of the Interstate System*

## ✿ 1980's

- *Logs converted to CADD using Intergraph software*

## ✿ 1990's

- *The Route Log System becomes defunct & Master series maintained with hand markups*

# Why an Automated Route Log System?



- ❖ ***The Directive From the Decision Makers - VTrans will produce a new series of Route Logs for all the State and Federal Aid Routes within Vermont***
- ❖ ***Provide one source of up-to-date information***
- ❖ ***Leverage Existing GIS and Data Warehouse***
- ❖ ***Simplify Route Log Production & Increase Efficiencies***



# Path to the Route Log System



- ❖ ***VTrans began internal discussions on a Route Log System.***
- ❖ ***Identification of stakeholders and the core user group.***
- ❖ ***Formation of a Route Log Committee.***
- ❖ ***VTrans entered into an agreement with GeoDecisions to perform a software assessment and survey of DOT's regarding straight line diagrams.***
- ❖ ***As part of the study, initial priorities based on user input were documented. This was used as a spring board to discuss the Route Log System and refining priorities.***



# Path to the Route Log System



- ❖ ***Definition of system requirements.***
- ❖ ***Articulating needs and priorities into an RFP.***
- ❖ ***VTrans enters into the Contracting Process.***
- ❖ ***VTrans selects GeoDecisions to build the Route Log System.***



# Path to the Route Log System



- ❖ ***In June of 2002, the Route Log Project began.***
- ❖ ***The project begins with a Kick-Off meeting with stakeholders.***
- ❖ ***2 days of Joint Application Development (JAD) Sessions***
- ❖ ***JAD's provide key insight to user needs & details on source data within the Agency.***
- ❖ ***The Mapping & GIS Unit gears up to extract data from existing CADD Logs and assists in dynamically segmenting data to add to the GIS.***



# Key Route Log System Requirements



- ✿ ***Support for 2 linear reference systems, Town Based & End to End (Cumulative)***
- ✿ ***Measures in English/Metric with Stationing in Feet or Meters and distance totals in miles or kilometers.***
- ✿ ***Interactive locator map***
- ✿ ***Geometrically correct straight line and map view***
- ✿ ***Seamed together, scrollable views***
- ✿ ***Identify tool***
- ✿ ***Addition of user-defined elements***
- ✿ ***Print capabilities for standard output and custom output***
- ✿ ***User defined templates***



# Route Log System Environment



- ❖ ***VTrans has a mature GIS based on ESRI software with a wide array of supporting data layers***
- ❖ ***The Route Log System prompted us to revisit data storage and formats and build a system that was supported by our current environment***
- ❖ ***Development of the SQL Server Data Warehouse – the “Relational Data Repository” in conjunction with ArcSDE***
- ❖ ***The data repository stores Event Tables with spatial components with standard linear reference codes***
  - Collected and corrected from throughout the enterprise
- ❖ ***ArcIMS 4 is being used to supply map content to the Web version of the Route Log System***
  - ArcMap Server for dynamic segmentation
- ❖ ***ArcGIS 8 provides the industrial strength version for the generation of the production route log sets***



# Route Log System Development



❖ **Two applications to meet varied needs and requirements**

❖ **Web**

- *Accessibility and ease of use*
- *Large number of users*

❖ **Desktop/ArcObjects**

- *Retain look-and-feel*
  - *Printing*
- *More functionality for power users*



# Route Log System Development



## ✿ Commonality among applications

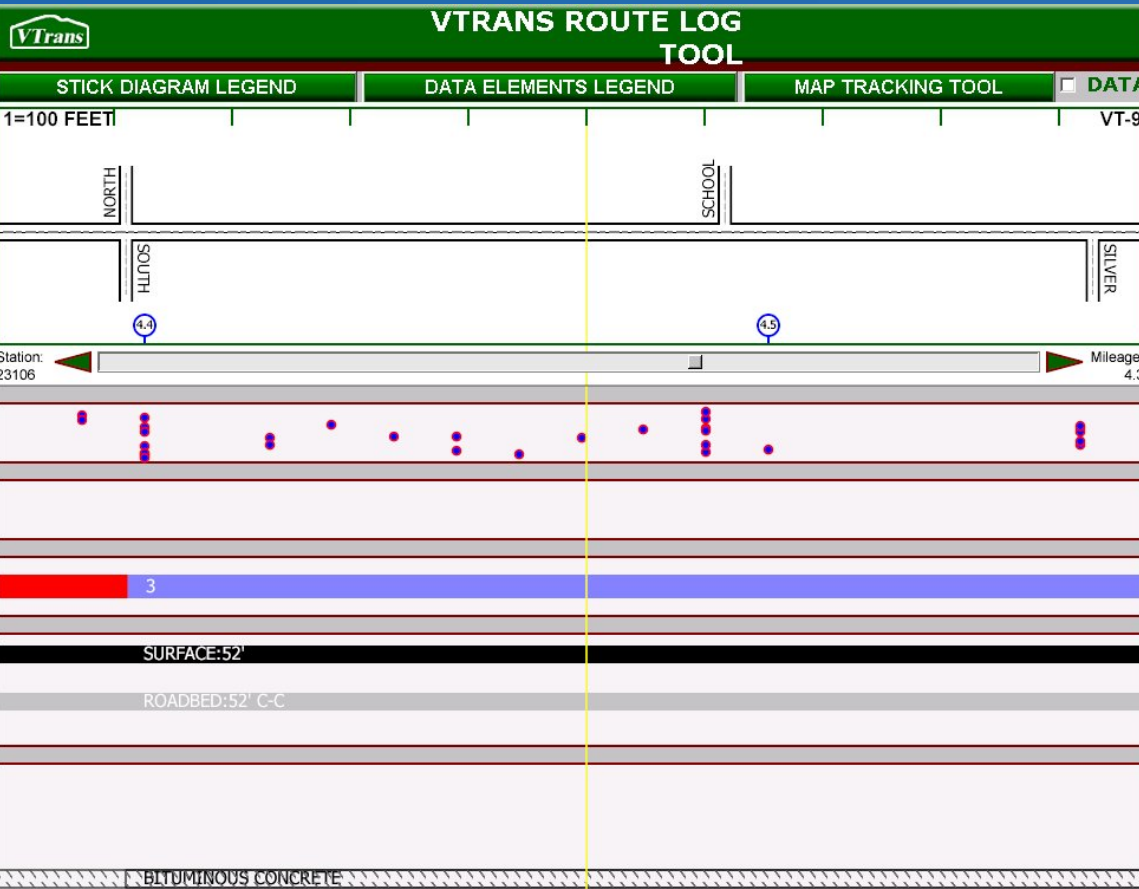
- *Work from the same data source*
- *Database views, queries, stored procedures*
- *Algorithms – Ex. How to handle stationing?*
- *Shared templates for common views*

## ✿ Convergence

- *.NET*
- *ArcGIS 9*



# Route Log System – Web Details



## Scalable Vector Graphics

- *Render all graphics*

## ArcIMS & ArcMap Server

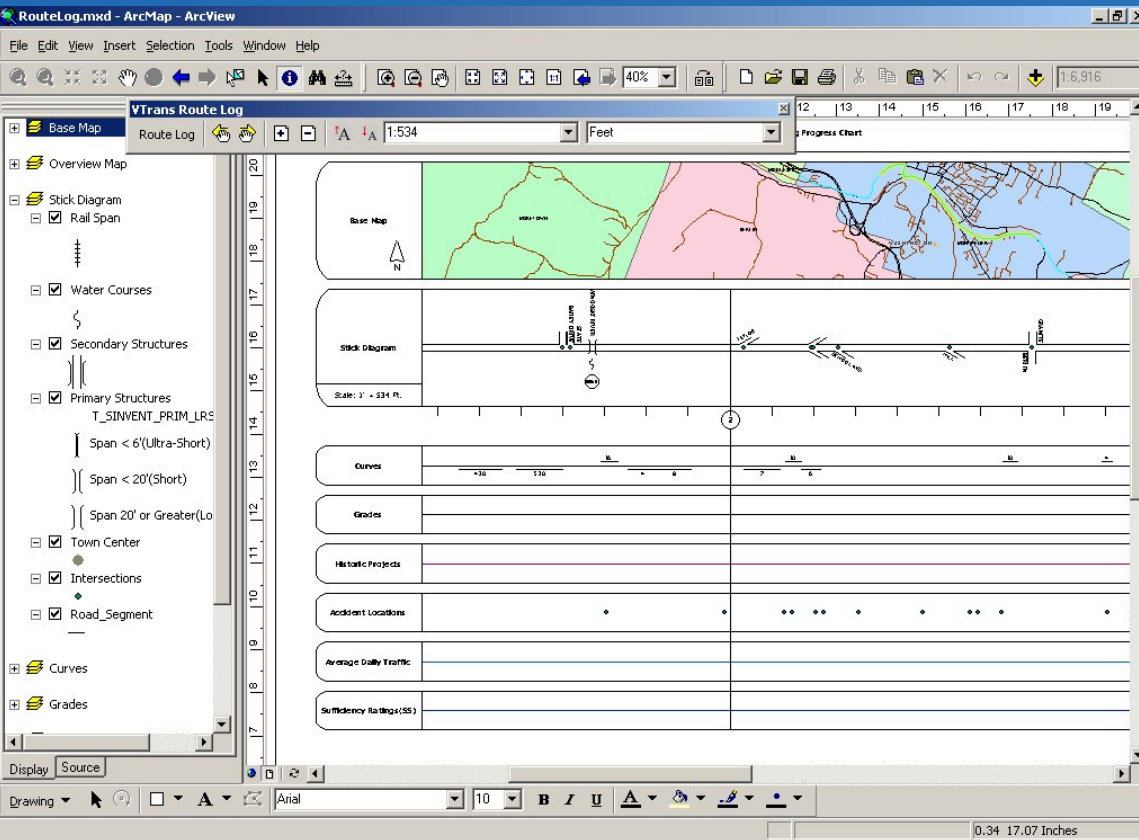
- *Map view and selection*

## Data linkage

- *Click and identify*
- *Tooltips*



# Route Log System – Desktop Details



✿ **ArcMap/ArcObjects**

➤ *ArcView level license*

✿ **VBA**

✿ **ArcGIS symbols**

✿ **Printing flexibility**

➤ *Multiple sheets/series*

➤ *Scales*

✿ **Ability to add local data sources**



# Route Log System – Desktop Details



**VTrans Vermont Route Log Generation Environment**

Define Route Log Display Options...

**Measures:**

Town-Based

End-to-End

**Display Units**

English (Feet)  Metric (Meters)

**Setup Options...**

**Route Log Elements:**  Select All

- Curves
- Grades
- Historic Projects
- Accident Locations
- Average Daily Traffic
- Sufficiency Ratings(SS)

Select the Display Segment Using Attributes or the Map...

Select a Town:

Select a Route:

Segments:

Start At Milepost:

End At Milepost:

Scale 1":  Feet



# Where Are We Now?



- ✿ **Requirements and Design analyses**
- ✿ **Prototype applications were completed in December, reviewed in January, finalized in February**
  - *Partial functionality*
  - *Work out the mechanics*
- ✿ **Final application development through May**
- ✿ **User and Technical Guides being prepared**



# Closing Credits



## VTrans staff

- *Johnathan Croft – Project Manager*
- *Shawn Nailor – Lead Technical Advisor*
- *Mike Eling, Roger Lyon-Surrey, Steph Magnan, etc.*

## GeoDecisions staff

- *Don Kiel and Chris Markel - Managers*
- *Rodney Bunner – Desktop developer*
- *Brendan Carroll – Web developer*

## ESRI staff

- *Boston and Redlands*



# Questions



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