

Mapping the Yellowstone Trail with GIS

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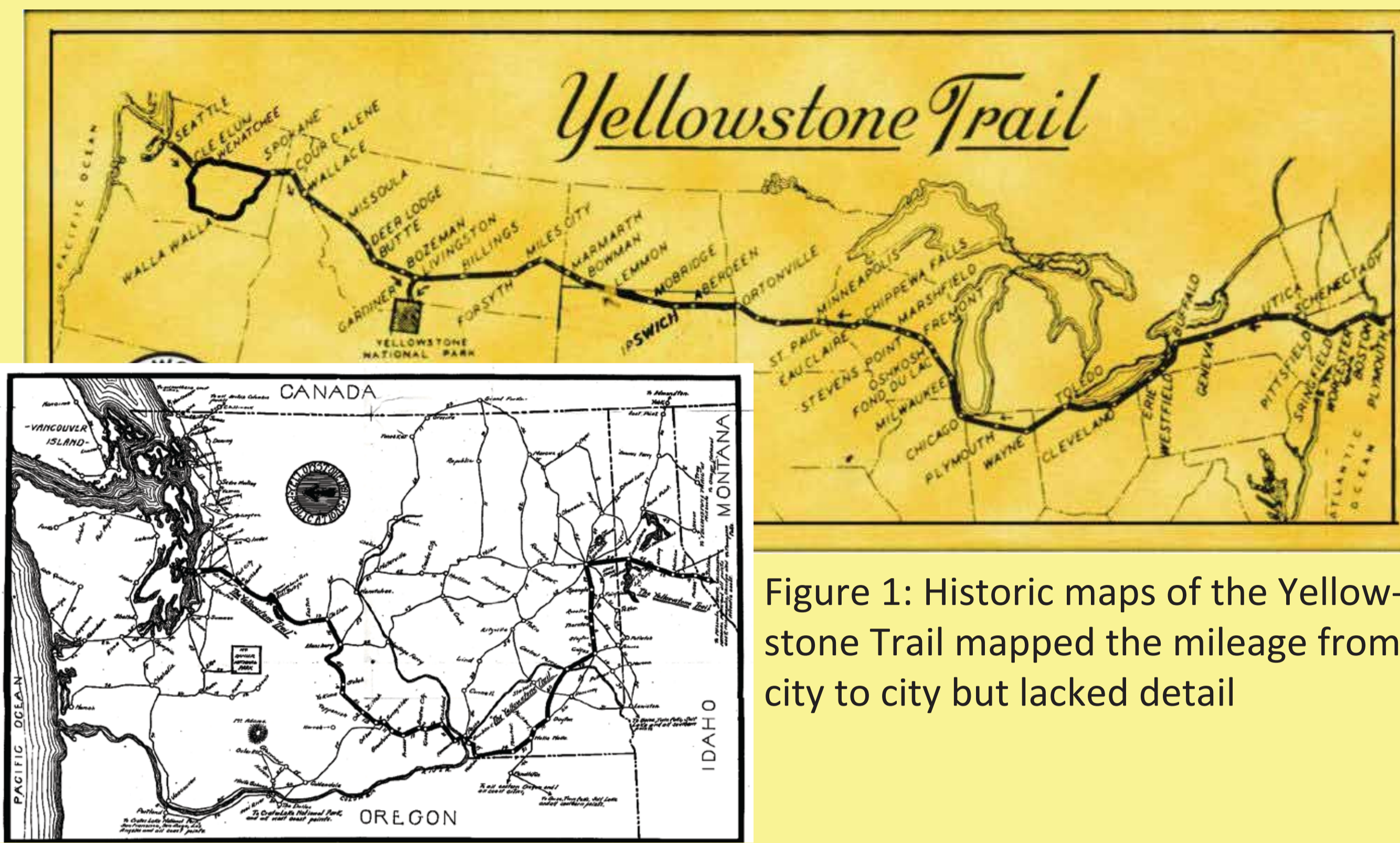


Figure 1: Historic maps of the Yellowstone Trail mapped the mileage from city to city but lacked detail

Introduction

In 1912, before numbered routes and government involvement, a group South Dakota businessmen formed the Yellowstone Trail Association to establish one of the first transcontinental auto routes in America. The route linked Plymouth, Massachusetts to Seattle, Washington. After years of promoting better highways and automobile tourism, all named highway associations faded with the Great Depression and state highway numbering. Much of the historic route has been lost or paved over. Recent, extensive research has pieced together the historic routes of the Yellowstone Trail using Yellowstone Trail Association publications and correspondences, USGS topographic maps, advertisements, newspaper and magazine articles, oral histories, historic maps (Fig.1) and turn of the century travel guides (Fig. 2). Advances in software technology provide new mapping opportunities. This project uses new technologies to help map the historic and modern driving route for the Yellowstone Trail by using the steps outlined in the flowchart found below. Final maps were suitable for publication in a variety of formats.

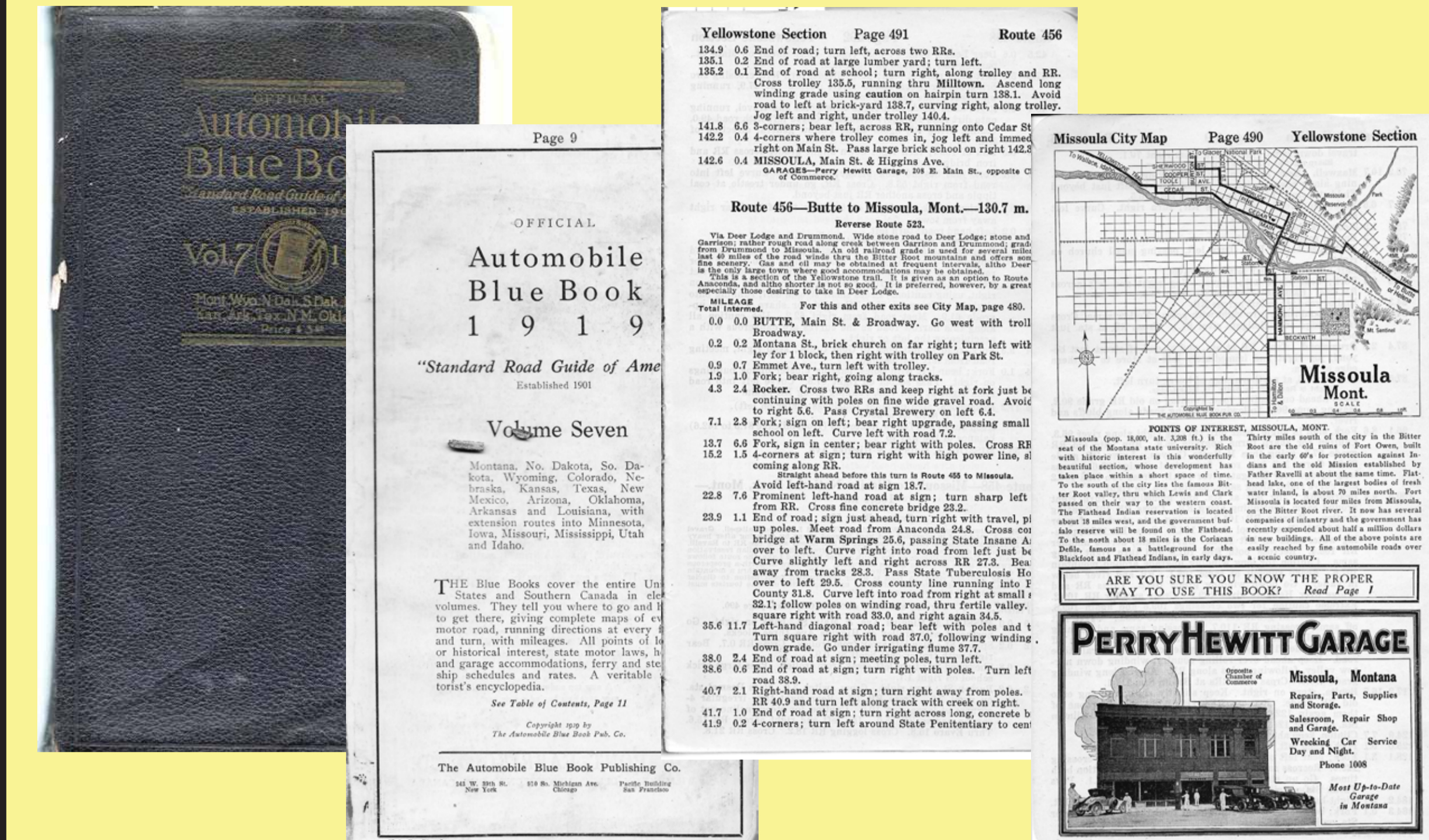


Figure 2: Historic guide books give turn by turn directions but lack maps in most areas.



Use the National Map Viewer to download county level data along Yellowstone Trail. Data includes topographic base map, roads, railroads, government unit boundaries, cities and water bodies. (Figure 3).

Selected item type: Counties
Selected item name: Corson, South Dakota

- Theme
- US Topo
- Historical Topo Maps
- Structures
- Transportation
- Boundaries
- Geographic Names
- USGS Map Indices
- Hydrography (NHD)
- Watershed Boundary Dataset (WBD)
- Contours
- Land Cover
- Elevation
- Orthomosaic

Data was divided by state and projected using the state plane coordinate system for each state. This allowed for the best preservation of true distance and direction for basemaps which were to be 28mi x 28mi.

The modern, driving trail was mapped from a combination of importing .GPX files and digitizing. In addition, mile markers along the trail were imported from GPS files. ArcGIS allows for the export of the final digitized trail as a .kml file capable of viewing in GoogleEarth.

Vector data was exported as a .pdf while raster data was exported as a .tiff using the following python script.

```
mxd = arcpy.mapping.MapDocument("CURRENT")
for pageNum in range(1, mxd.dataDrivenPages.pageCount + 1):
    mxd.dataDrivenPages.currentPageID = pageNum
    arcpy.mapping.ExportToTIFF(mxd,
    r"C:\users\sean\desktop\MT\shadedrelief" + str(pageNum) + ".TIFF")
del mxd
```

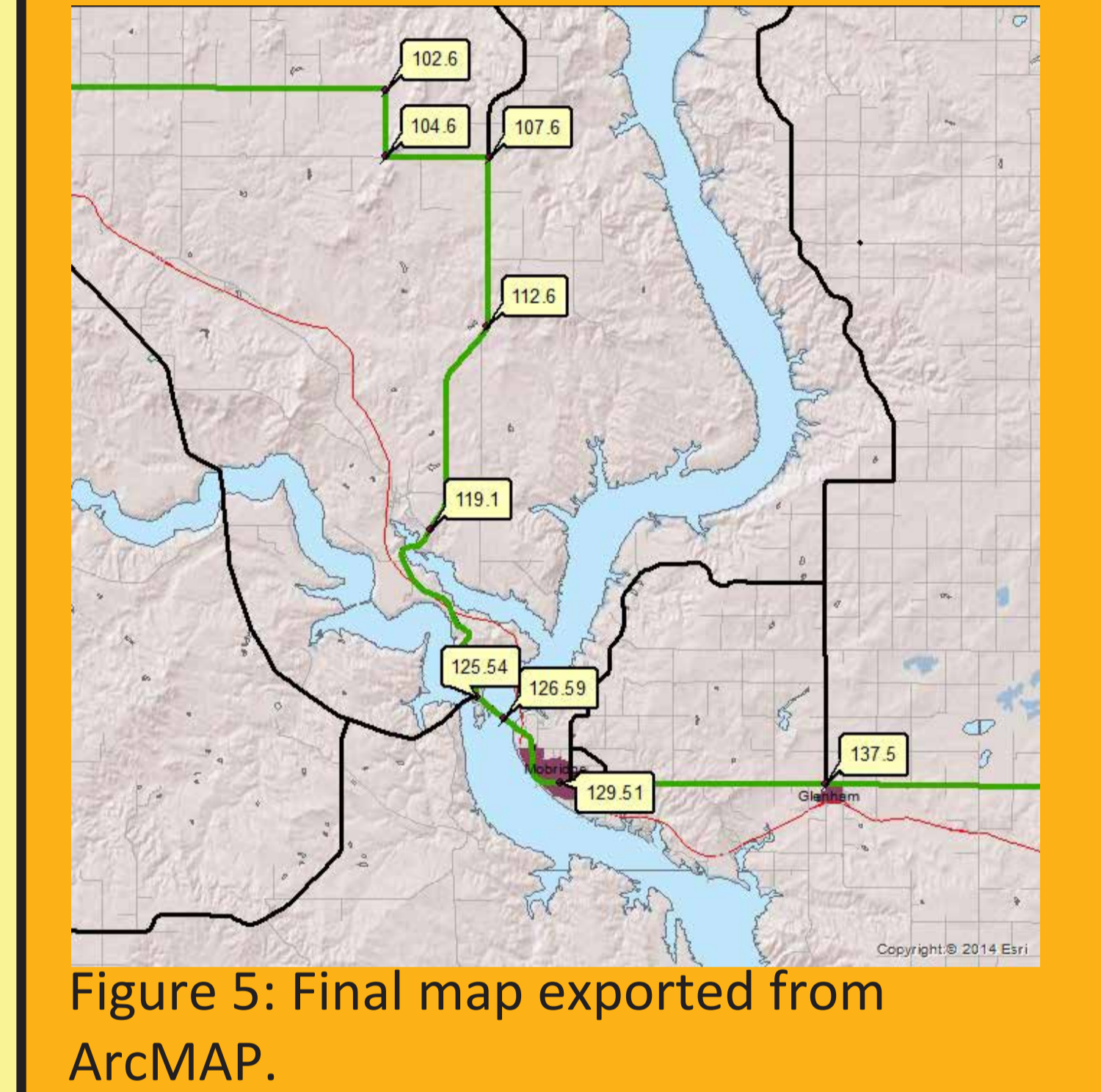


Figure 5: Final map exported from ArcMAP.

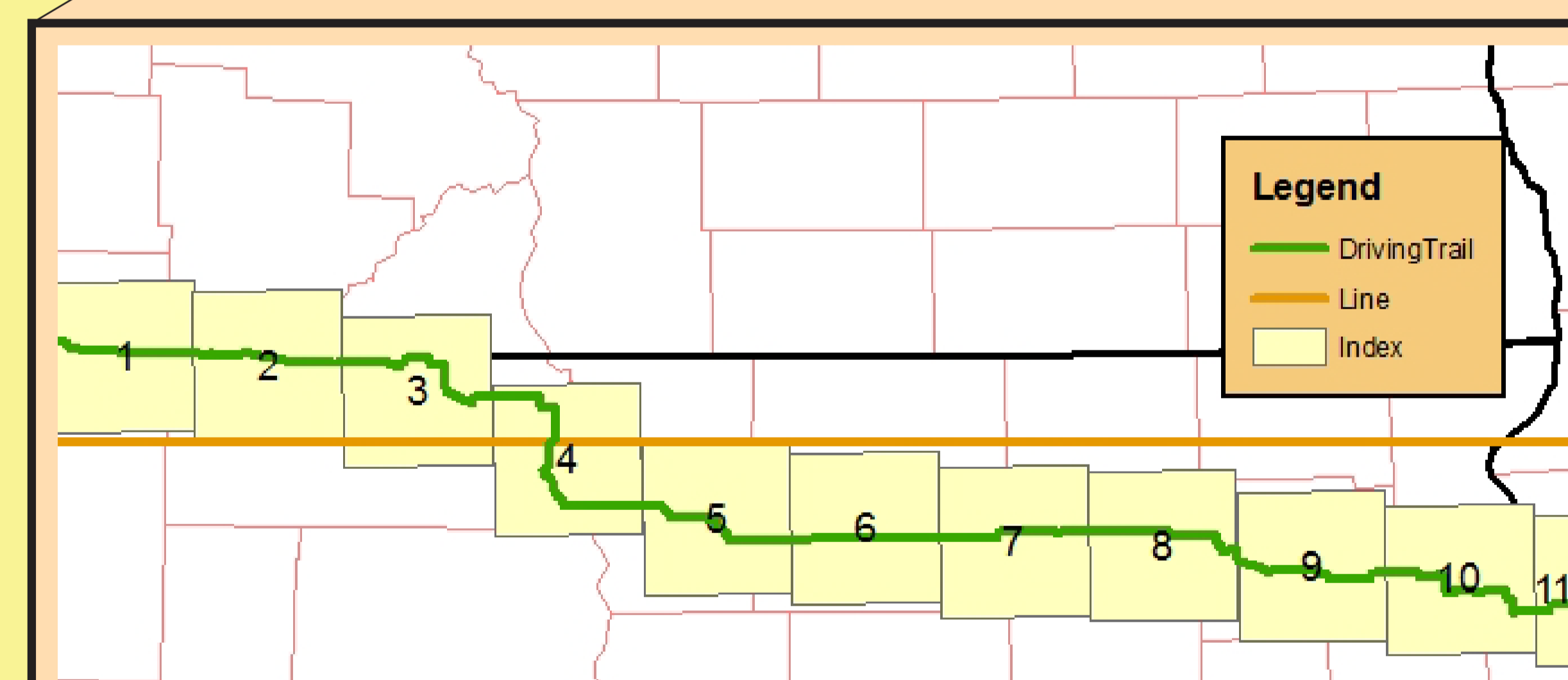


Figure 4: Index feature were created along a straight line transect and then moved to overlap the Yellowstone Trail and data driven pages were created.

Data driven pages are a new tool developed for ArcMAP that allow quick creation of a map series from a single map document. An index layer, created based on map features, generates a series of polygons, from which maps are based. A straight line was used to create index layer and then polygons were moved to overlap the driving Yellowstone Trail. A map book was then exported with each index polygon as a separate page.

Data was imported into CorelDraw and .tiff and .pdf were recombined for final edits and digitization of the historic routes by Dr Ridge.

Conclusion

GIS proved a substantial help in creating final maps (Fig. 6). Topographic background layers provided an inviting frame for the map to be drawn on. Furthermore, the use of GIS data sets saved time in drawing roads, cities, water bodies, government boundaries and the modern driving trail. Since these layers were already drawn, the original Yellowstone Trail, digitized by Dr Ridge in CorelDraw, could be easily drawn on top of GIS based layers. The final maps include mile markers that will be used by Yellowstone Trail Publishers to direct readers to sites along the Yellowstone Trail. Final publications will guide people along the Yellowstone Trail to help modern American drivers connect with the past car routes across the American countryside.

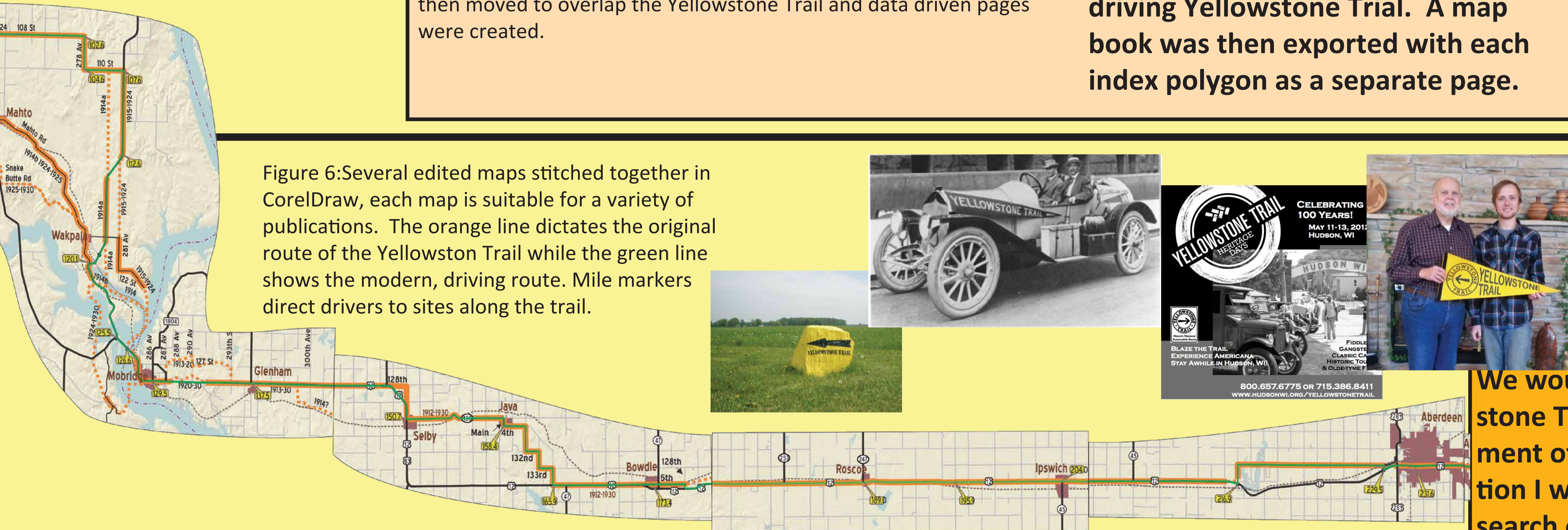
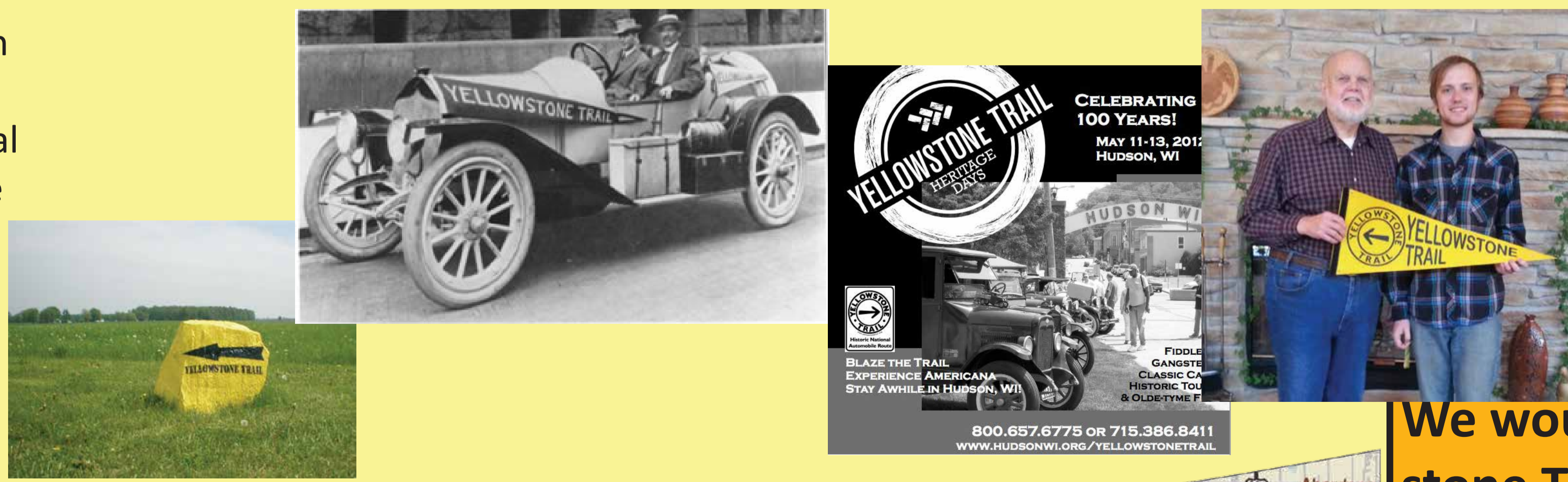


Figure 6: Several edited maps stitched together in CorelDraw, each map is suitable for a variety of publications. The orange line dictates the original route of the Yellowstone Trail while the green line shows the modern, driving route. Mile markers direct drivers to sites along the trail.



Acknowledgements

We would like to thank the Yellowstone Trail Association and the Yellowstone Trail Publishers and the University of Wisconsin-Eau Claire Department of Geography and Anthropology for funding this project. In addition I would like to thank Dr John Ridge and others for extensive research on mapping the historic route of the Yellowstone Trail.