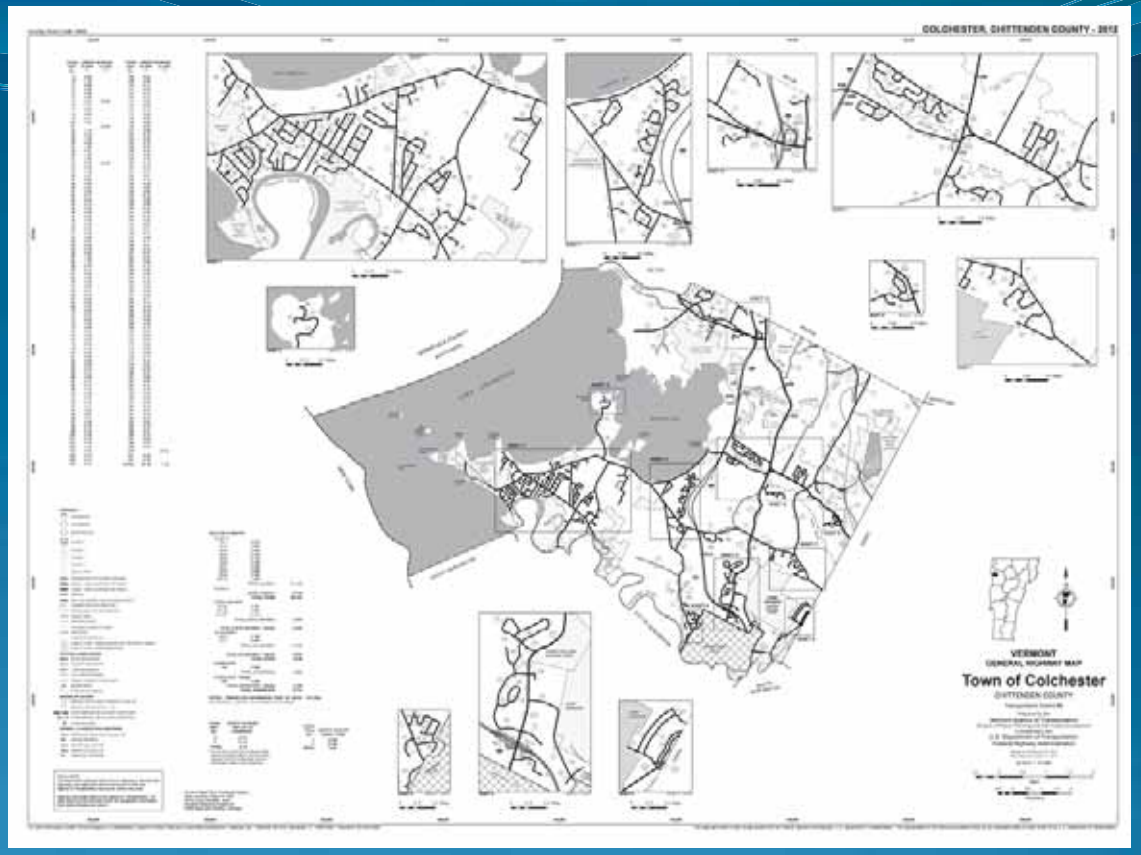
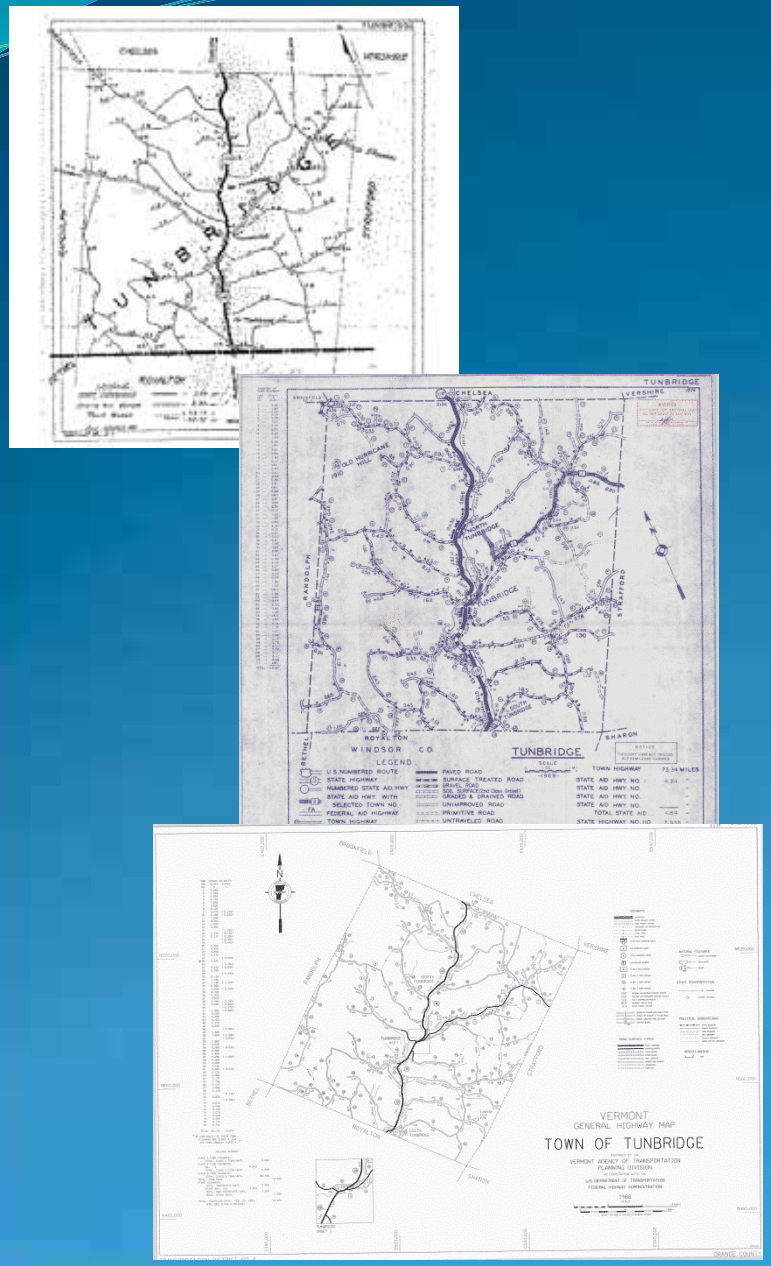



# Leveraging Python to Revolutionize the Production of the Vermont Town Highway Maps

Vermont Agency of Transportation

Esri UC 2013

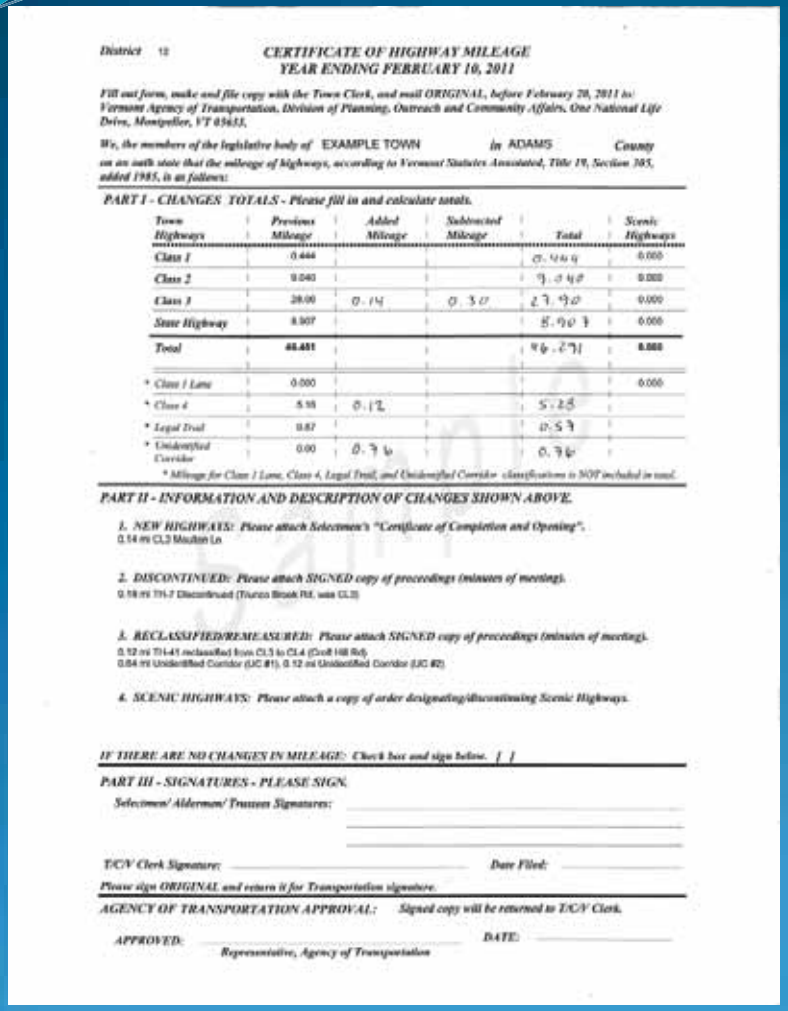
# The Purpose




The Mapping Unit of the Agency of Transportation has produced Town Highway Maps since the first series in 1931, based on a statutory requirement. The chief purpose of these maps is to document highway classification and mileage of town highways for use in calculating State Aid for town highway maintenance. The Highway Mapping System (HMS) is the tool used to create the maps.

http://vtransplanning.vermont.gov/maps/archive

# Annual Map Updates



District 12

**CERTIFICATE OF HIGHWAY MILEAGE**
**YEAR ENDING FEBRUARY 10, 2011**

*Fill out form, make and file copy with the Town Clerk, and mail ORIGINAL, before February 20, 2011 to: Vermont Agency of Transportation, Division of Planning, Outreach and Community Affairs, One National Life Drive, Montpelier, VT 05633.*

*We, the members of the legislative body of* EXAMPLE TOWN *in* ADAMS *County on an oath state that the mileage of highways, according to Vermont Statutes Annotated, Title 19, Section 305, added 1985, is as follows:*

*PART I - CHANGES TOTALS - Please fill in and calculate totals.*

| Town Highways | Previous Mileage | Added Mileage | Subtracted Mileage | Total | Scenic Highways |
|---|---|---|---|---|---|
| Class 1 | 0.444 | | | 0.444 | 0.000 |
| Class 2 | 9.040 | | | 9.040 | 0.000 |
| Class 3 | 28.00 | 0.14 | 0.30 | 27.90 | 0.000 |
| State Highway | 8.907 | | | 8.907 | 0.000 |
| Total | 46.481 | | | 46.291 | 0.000 |
| * Class 1 Lane | 0.000 | | | | 0.000 |
| * Class 4 | 5.55 | 0.12 | | 5.25 | |
| * Legal Trail | 0.87 | | | 0.53 | |
| * Unidentified Corridor | 0.00 | 0.76 | | 0.76 | |

* Mileage for Class 1 Lane, Class 4, Legal Trail, and Unidentified Corridor classifications is NOT included in total.

*PART II - INFORMATION AND DESCRIPTION OF CHANGES SHOWN ABOVE.*

*1. NEW HIGHWAYS: Please attach Selectmen's "Certificate of Completion and Opening".*
0.14 mi CL3 Maulton Ln

*2. DISCONTINUED: Please attach SIGNED copy of proceedings (minutes of meeting).*
0.18 mi TH-7 Discontinued (Trueco Brook Rd, was CL3)

*3. RECLASSIFIED/REMEASURED: Please attach SIGNED copy of proceedings (minutes of meeting).*
0.12 mi TH-45 reclassified from CL3 to CL4 (Croft Hill Rd)
0.64 mi Unidentified Corridor (UC #1), 0.12 mi Unidentified Corridor (UC #2)

*4. SCENIC HIGHWAYS: Please attach a copy of order designating/discontinuing Scenic Highways.*

*IF THERE ARE NO CHANGES IN MILEAGE: Check box and sign below.* [ ]

*PART III - SIGNATURES - PLEASE SIGN.*

*Selectmen/ Aldermen/ Trustees Signatures:* _____

*T/C/V Clerk Signature:* _____ *Date Filed:* _____

*Please sign ORIGINAL and return it for Transportation signature.*

*AGENCY OF TRANSPORTATION APPROVAL: Signed copy will be returned to T/C/V Clerk.*

*APPROVED:* _____ *DATE:* _____
*Representative, Agency of Transportation*

The maps are updated annually based on information supplied by municipalities on a formal Mileage Certificate. Typically between 50 and 100 municipalities submit changes during any given year.

These changes include additions, alterations, reclassifications and discontinuances.

# Map Production

Master datasets maintained in ArcSDE are used to render the highways, structures, mileage annotation, shields, and other features.

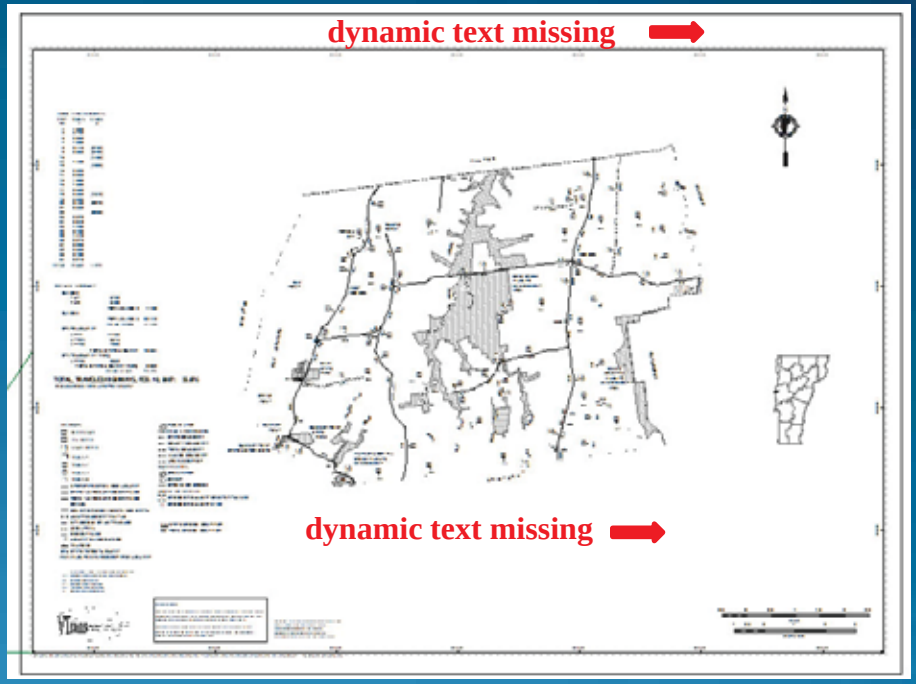
| Name | Date modified | Type | Size |
|---|---|---|---|
| ADDISON_MILEAGE_2011.mxd | 10/26/2011 2:19 PM | ArcGIS ArcMap D... | 2,199 KB |
| ALBANY_MILEAGE_2011.mxd | 10/26/2011 2:27 PM | ArcGIS ArcMap D... | 1,282 KB |
| ALBANY_MILEAGE_2011_a.mxd | 12/14/2011 9:46 AM | ArcGIS ArcMap D... | 1,305 KB |
| ALBURGH_MILEAGE_2011.mxd | 10/26/2011 8:39 AM | ArcGIS ArcMap D... | 4,430 KB |
| ANDOVER_MILEAGE_2011.mxd | 10/26/2011 8:43 AM | ArcGIS ArcMap D... | 2,666 KB |
| BARRE_MILEAGE_2011.mxd | 10/26/2011 1:14 PM | ArcGIS ArcMap D... | 4,743 KB |
| BELVIDERE_MILEAGE_2011.mxd | 10/26/2011 2:30 PM | ArcGIS ArcMap D... | 2,375 KB |
| BERLIN_MILEAGE_2011.mxd | 10/26/2011 2:37 PM | ArcGIS ArcMap D... | 5,686 KB |
| BRANDON_MILEAGE_2011.mxd | 10/27/2011 1:32 PM | ArcGIS ArcMap D... | 2,633 KB |
| BRATTLEBORO_MILEAGE_2011.mxd | 10/26/2011 3:41 PM | ArcGIS ArcMap D... | 4,016 KB |
| BRATTLEBORO_UC_MILEAGE_2011.mxd | 10/25/2011 2:24 PM | ArcGIS ArcMap D... | 2,048 KB |
| BRUNSWICK_MILEAGE_2011.mxd | 10/26/2011 3:43 PM | ArcGIS ArcMap D... | 1,719 KB |
| BURLINGTON_MILEAGE_NORTH_2011.mxd | 10/26/2011 10:09 ... | ArcGIS ArcMap D... | 1,426 KB |
| BURLINGTON_MILEAGE_SOUTH_2011.mxd | 10/26/2011 10:14 ... | ArcGIS ArcMap D... | 904 KB |
| CALAIS_MILEAGE_2011.mxd | 10/26/2011 3:46 PM | ArcGIS ArcMap D... | 3,180 KB |
| COLCHESTER_MILEAGE_2011.mxd | 10/26/2011 12:42 ... | ArcGIS ArcMap D... | 8,482 KB |
| COVENTRY_MILEAGE_2011.mxd | 10/26/2011 3:48 PM | ArcGIS ArcMap D... | 2,552 KB |
| DERBY_LINE_VI_MILEAGE_2011.mxd | 10/26/2011 3:51 PM | ArcGIS ArcMap D... | 1,813 KB |
| DERBY_MILEAGE_2011.mxd | 10/26/2011 3:52 PM | ArcGIS ArcMap D... | 6,587 KB |
| EDEN_MILEAGE_2011.mxd | 10/26/2011 3:56 PM | ArcGIS ArcMap D... | 1,210 KB |
| ELMORE_MILEAGE_2011.mxd | 10/26/2011 3:57 PM | ArcGIS ArcMap D... | 2,496 KB |
| ENOSBURG_VI_MILEAGE_2011.mxd | 10/26/2011 8:48 AM | ArcGIS ArcMap D... | 1,782 KB |
| ESSEX_MILEAGE_2011.mxd | 10/26/2011 3:59 PM | ArcGIS ArcMap D... | 2,668 KB |
| ESSEX_UC_MILEAGE_2011.mxd | 10/25/2011 1:48 PM | ArcGIS ArcMap D... | 1,813 KB |
| FAIR_HAVEN_MILEAGE_2011.mxd | 10/26/2011 8:50 AM | ArcGIS ArcMap D... | 3,134 KB |
| FAIRFIELD_MILEAGE_2011.mxd | 10/26/2011 4:02 PM | ArcGIS ArcMap D... | 3,099 KB |
| FRANKLIN_MILEAGE_2011.mxd | 10/27/2011 8:42 AM | ArcGIS ArcMap D... | 2,490 KB |
| GRAFTON_MILEAGE_2011.mxd | 10/27/2011 8:44 AM | ArcGIS ArcMap D... | 3,793 KB |
| GRANVILLE_MILEAGE_2011.mxd | 10/27/2011 1:34 PM | ArcGIS ArcMap D... | 3,828 KB |
| GUILDHALL_MILEAGE_2011.mxd | 10/27/2011 8:48 AM | ArcGIS ArcMap D... | 2,507 KB |
| HANCOCK_MILEAGE_2011.mxd | 10/27/2011 8:40 AM | ArcGIS ArcMap D... | 2,531 KB |

319 individual MXD's were used until the 2012 series to generate the Town Highway Maps. Each MXD was updated individually to produce the Town Highway Map.

# The Problem

Upgrades in the Esri software broke previously created MXD's, requiring the overhaul and rebuilding of each MXD to create the same Town Highway Map. Key issues included inserted Objects, such as the Mileage Reports and Dynamic Text through PLTS not supported the same way from one version to the next.

Components of the maps used VBA, as Esri ends its support of VBA this will become problematic




In 2007, about 100 MXD's using ArcInfo 9.1 were rebuilt for that year's production, plus another 100 in preparation for future years.

All the maps needed to be retooled due to changes in 9.2 PLTS dynamic text changes. Every MXD was rebuilt.

# The Problem - continued

MILEAGE REPORTS

-- Mileage reports were RTF files generated out of MS Access and then insert into the map as an object -- this caused several problems.

-- 9.2 ArcMap didn't handle inserted objects well, couldn't produce the maps using 9.2, had to have a PC remain back at 9.1 until 9.3 came out

-- MS Access connected to the Default table of the SDE road centerline data - either we had to build a model to copy the data out to a personal geodatabase or wait until after the overnight compress moved the day's data edits to the Default table.

-- Because of the Object - couldn't use script to auto generate the PDFs from multiple MXDs, had to go into each MXD and export the PDF

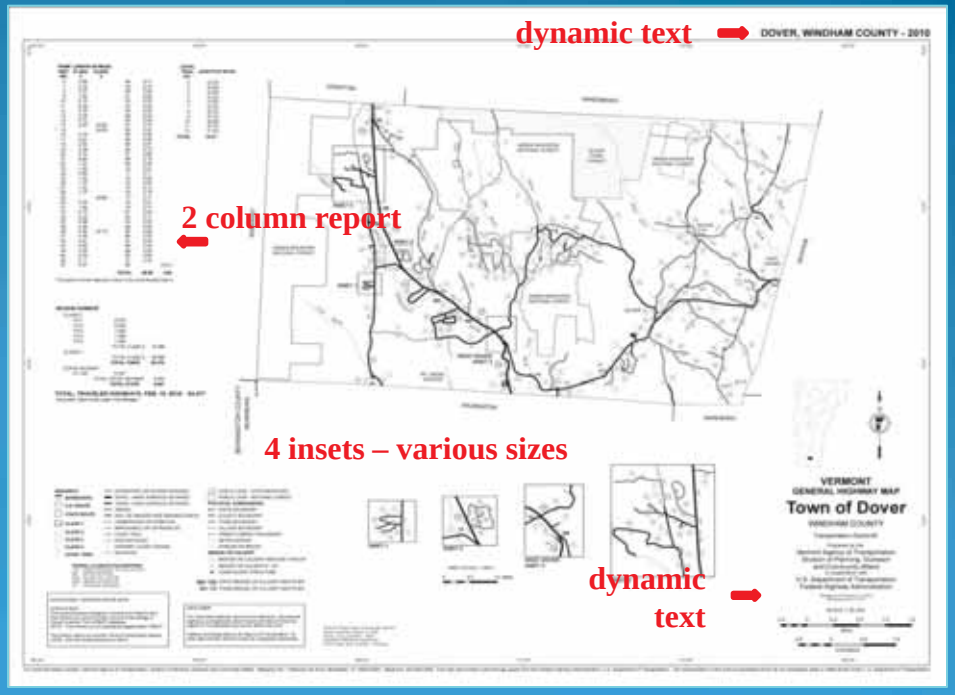
| TOWN HWY. NO. | LENGTH IN MILES CLASS 3 | CLASS 4 |
|---|---|---|
| 4 | 4.050 | |
| 5 | 3.750 | |
| 6 | 2.950 | |
| 7 | 1.200 | |
| 8 | 0.440 | (0.150) |
| 9 | 0.060 | (0.780) |
| 10 | | (1.400) |
| 11 | 1.450 | |
| 12 | | (1.090) |
| 13 | 2.520 | |
| 14 | 0.950 | |
| 15 | 1.080 | |
| 16 | 1.600 | |
| 17 | 0.550 | |
| 18 | 0.560 | (1.340) |
| 19 | 0.200 | |
| 20 | 0.450 | (0.070) |
| 21 | 0.550 | |
| 22 | | (0.250) |
| 23 | 0.070 | |
| 24 | 3.640 | |
| 25 | 1.700 | |
| 26 | 0.160 | |
| 28 | 1.470 | |
| 30 | 0.070 | |
| 31 | 0.220 | |
| 32 | 0.350 | |
| 33 | 0.190 | |
| 34 | 0.210 | |
| **TOTAL** | **30.440** | **5.080** |

# Solution - Data Driven Pages or Production Mapping???

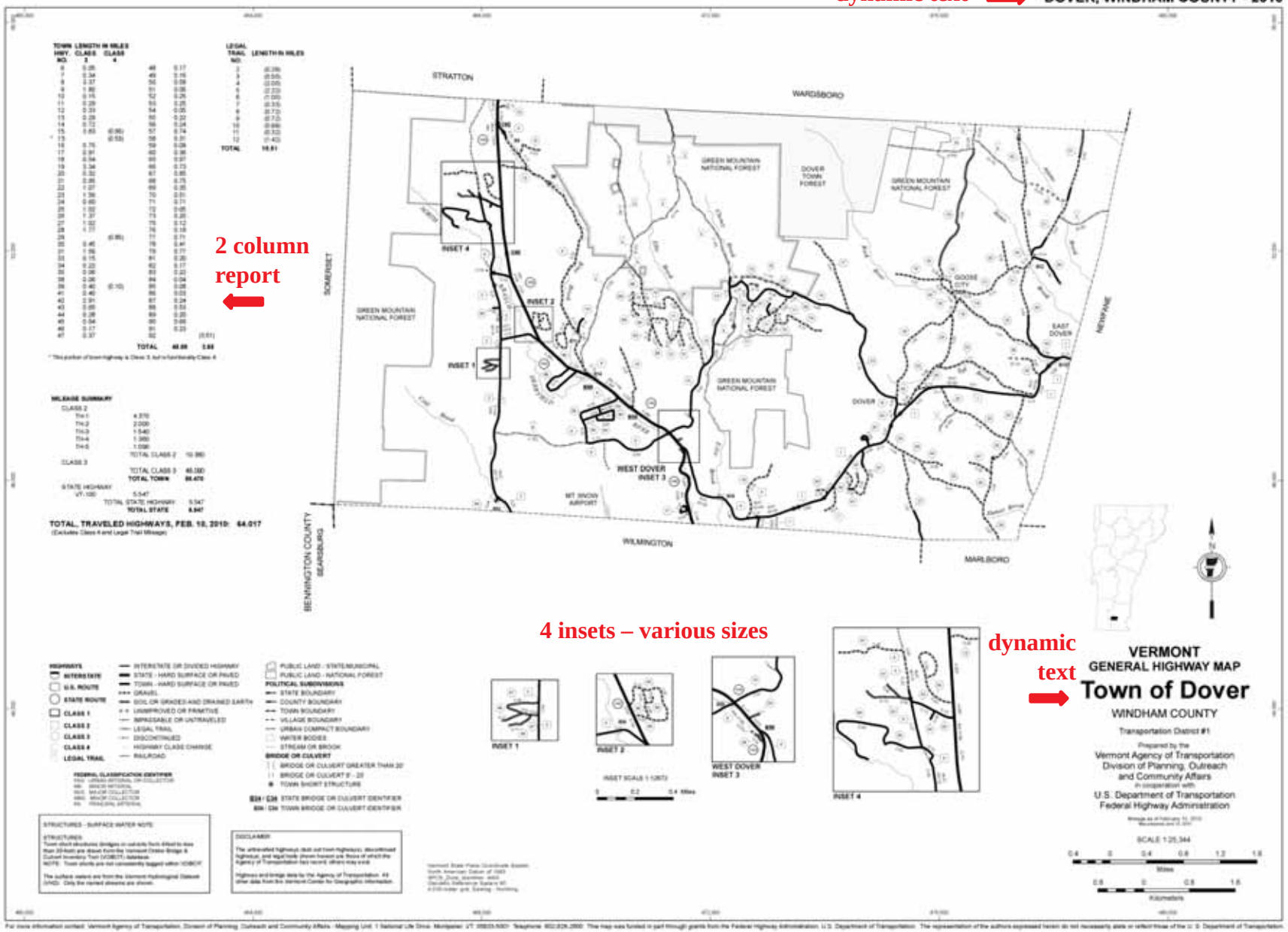
NO!!! - There is too much variability in each map to be able to leverage Data Driven Pages (DDP) or Production Mapping.

Variable Map Scales
Variable Insets – #, Size & Scale
Variable Mileage Summary Sizes
Variable Reports -
- Class 3 & 4
- Legal Trail
- Not-Up-To-Standards

Variable Town Shapes and Sizes



dynamic text → DOVER, WINDHAM COUNTY - 2010

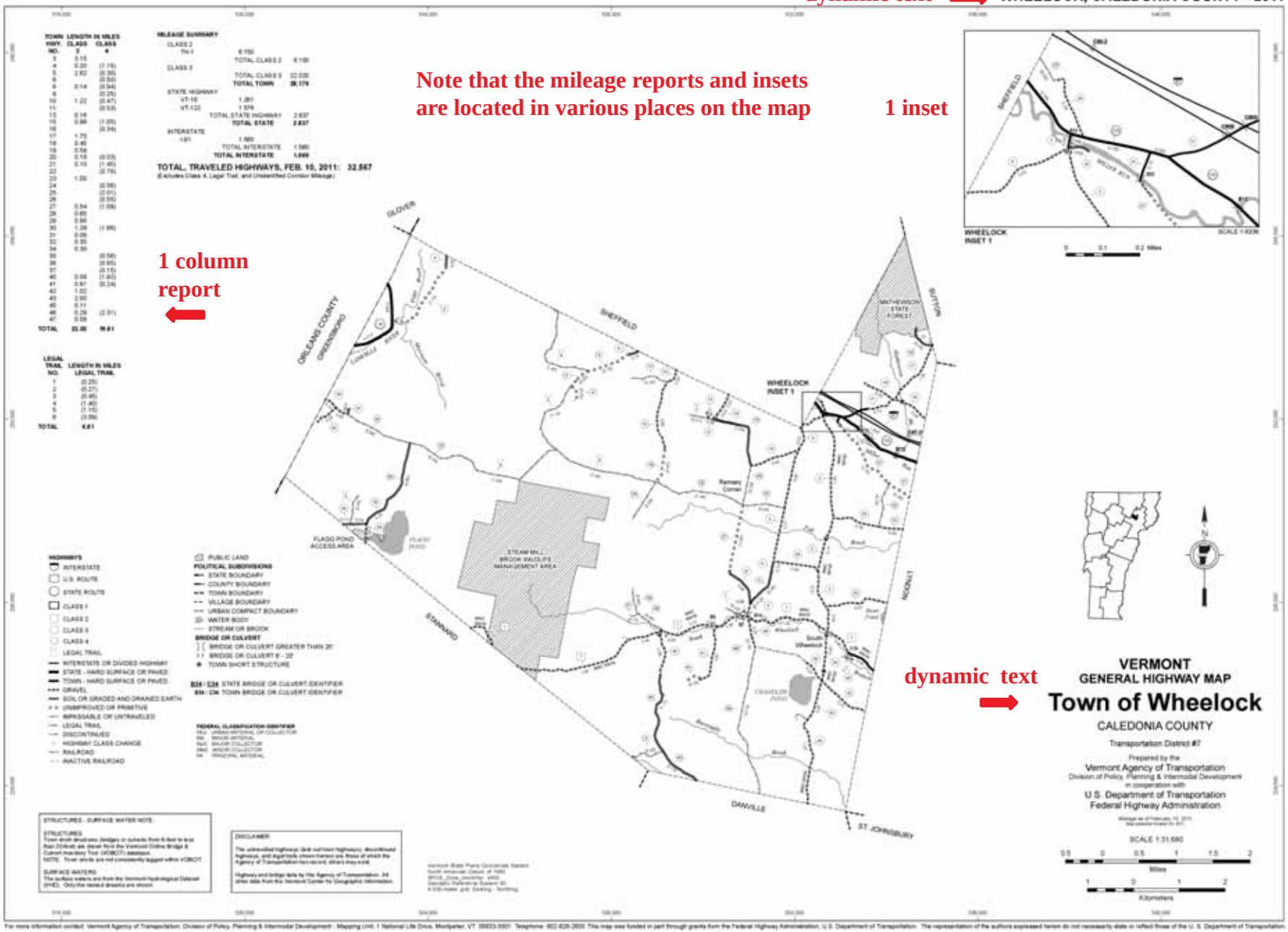


dynamic text → WHEELOCK, CALEDONIA COUNTY - 2011

Note that the mileage reports and insets are located in various places on the map

1 inset

1 column report




dynamic text →

VERMONT
GENERAL HIGHWAY MAP

# Town of Wheelock

CALEDONIA COUNTY

Transportation District #7

Prepared by the
Vermont Agency of Transportation
Division of Policy, Planning & Intermodal Development
in cooperation with
U.S. Department of Transportation
Federal Highway Administration

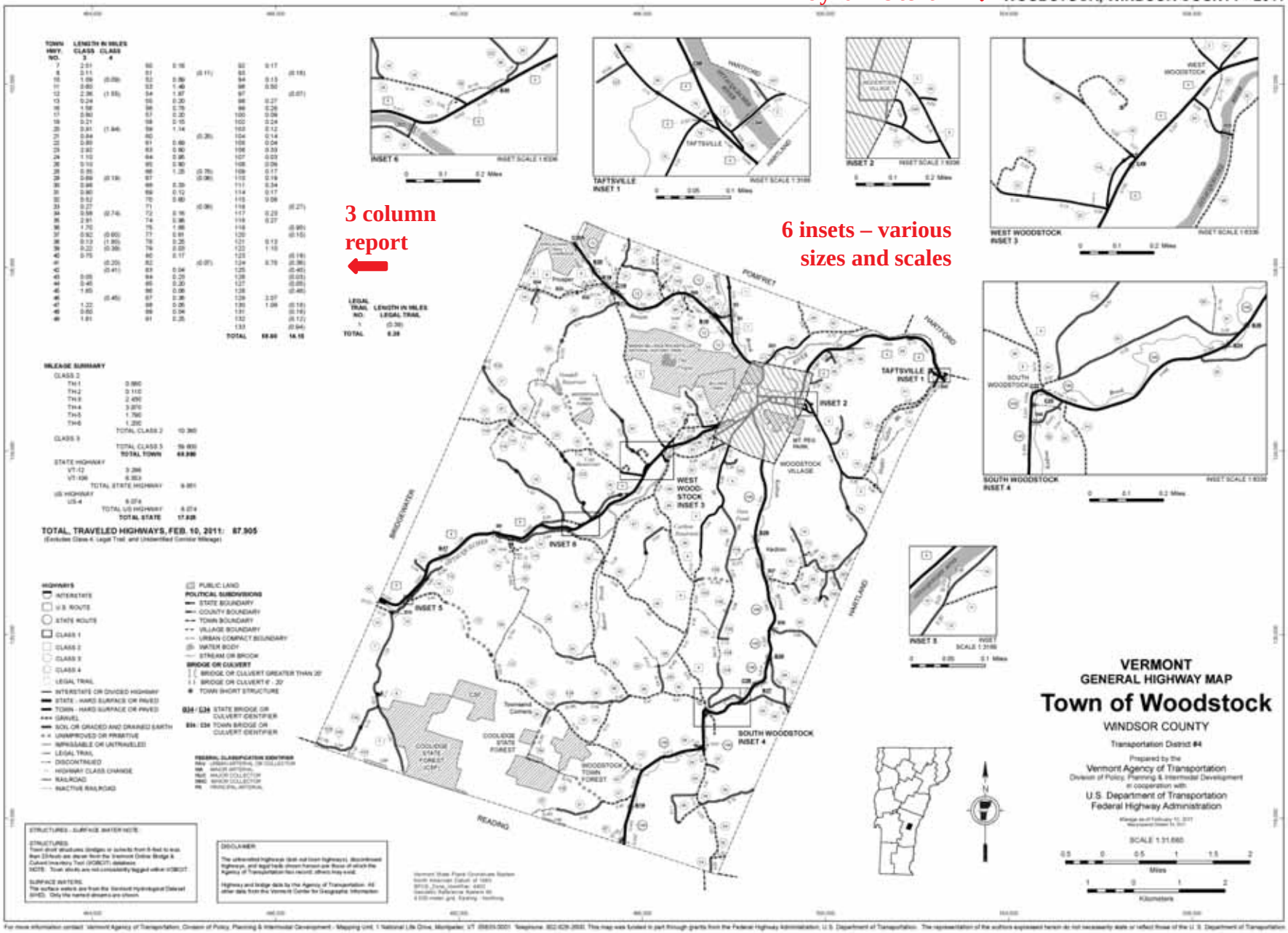
SCALE 1:31,680

Miles

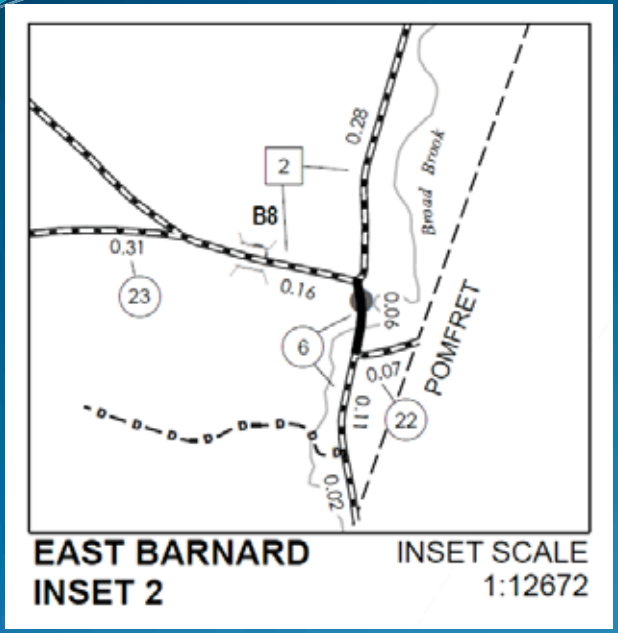
Kilometers

For more information contact: Vermont Agency of Transportation, Division of Policy, Planning & Intermodal Development - Mapping Unit, 1 National Life Drive, Montpelier, VT 05633-5001 Telephone: 802-828-2600 This map was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The representation of the authors expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

dynamic text → WOODSTOCK, WINDSOR COUNTY - 2011



# Challenges & System Requirements




| TOWN HWY. No. | LENGTH IN MILES "NOT UP TO STANDARD" |
|---|---|
| 18 | (0.10) |
| 21 | (0.22) |
| 53 | (0.08) |
| 91 | (0.06) |
| 101 | (0.08) |
| **TOTAL** | **0.54** |

* The sections of the town highways listed above are legally Class 3, but have been deemed "Not Up To Standard" and are functionally Class 4 Town Highways

The Solution needed to accommodate the following requirements:

**Multiple Insets** – MPS-Atlas and Data Driven Pages couldn't handle them

**Mileage reports** – couldn't use the reporting tool in ArcMap – it wouldn't limit the report data to just the map town's data, also dynamic graphic table didn't work – the reports were too sophisticated

**Variable Town Shape, Size and Page Layout**

**Need to eliminate annual Retooling**

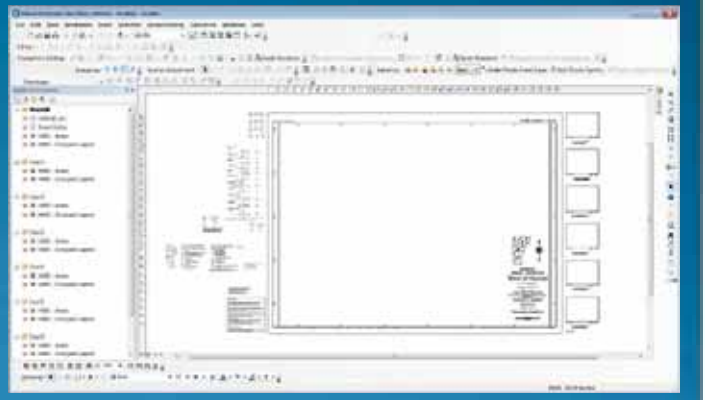
# The Solution – Python

## Key Components

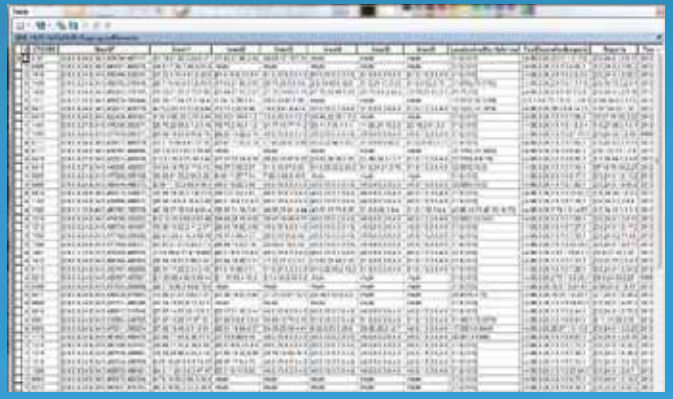
VTrans reached out to Esri Boston for assistance and was connected with Jeff Barrette, Product Developer in Esri's Holistic Testing and the Map Automation teams. Jeff provided a very creative and elegant solution.

Data

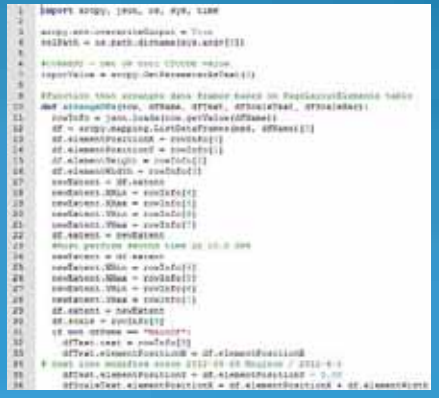
ArcMap Template



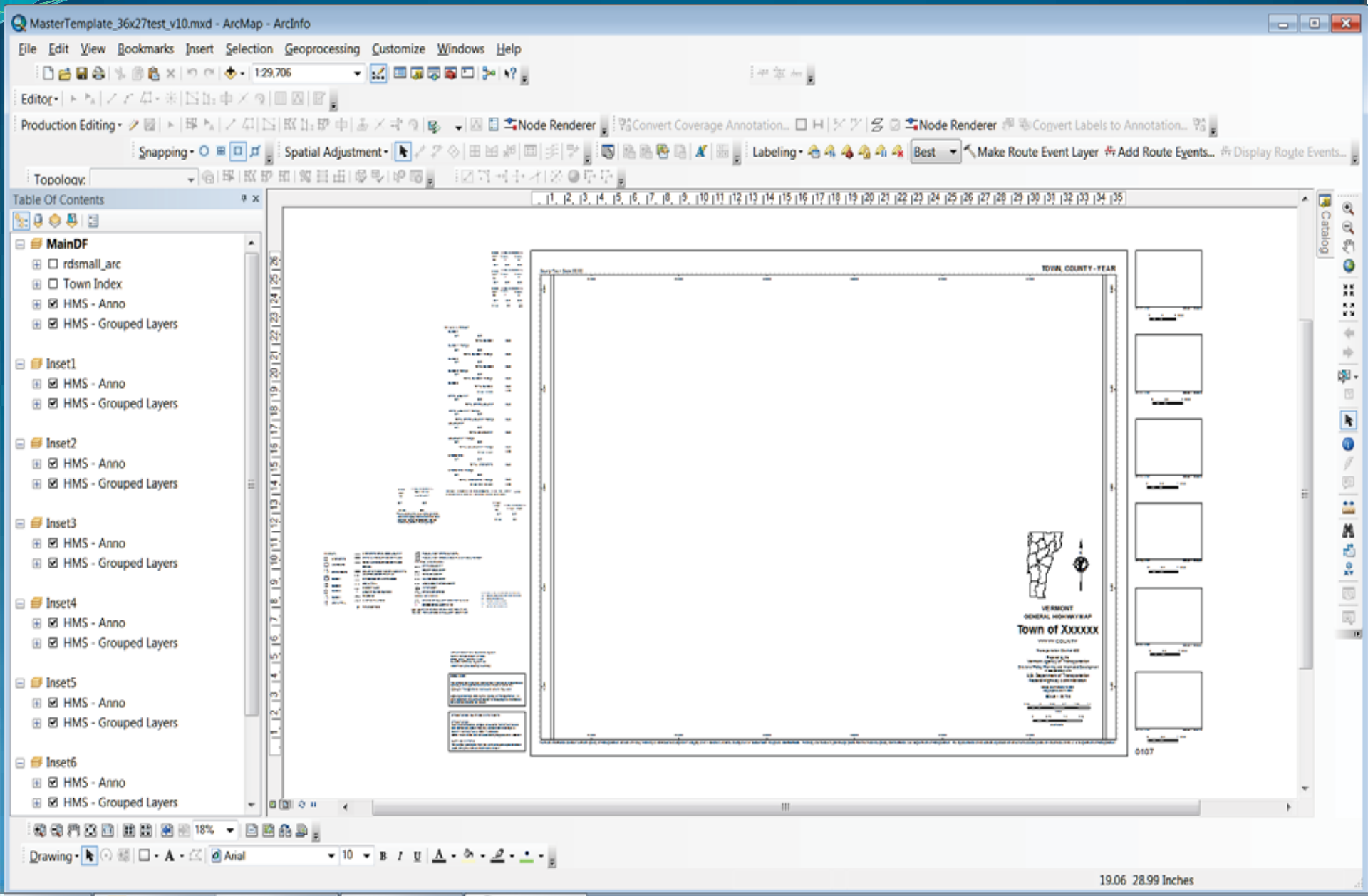
Page Layout Elements Table



Python Scripts



# ArcMap Master MXD Template



# Page Layout Elements Table

Each record represents the layout specifications for a map, and each field contains the layout parameters for a Data Frame or other layout element within that map.

Town

Table

PageLayoutElements

| OBJECTID * | CTCODE | MainDF | Inset1 | |
|---|---|---|---|---|
| 1 | 0107 | [0.9,0.9,24.8,34.5,459394,487317,157306,177262,31680] | [21.74,21.26,3.24,6.17,468768,470759,165635,166680,12672,"INSET 1"] | [17.45,21. |
| 2 | 0406 | [0.9,0.9,24.8,34.5,441051,468976,216649,236607,31680] | [24.9,17.38,7.48,9.61,448381,451312,222621,224903,12000,"INSET 1"] | <Null> |
| 3 | 1016 | [0.9,0.9,24.8,34.5,500486,528247,259145,279101,31680] | [21.22,4.11,4.91,6.28,514819,515830,271801,272591,6336,"NEWPORT CENTER \nINSET 1"] | [51.0,19.5 |

. . .

[Data Frame $X_{position}$, $Y_{position}$, height, width, extent, scale]

Possible to include formatted text

Table

PageLayoutElements

| Inset6 | LocatorAndNorthArrow | TextBoxesAndLegend | Reports | Year | Layout |
|---|---|---|---|---|---|
| <Null> | [31.9,10.5] | [-4.96,0.26,23.11,1.5,15.88,1.5,2.0,1.5] | [2.0,24.0,1,2.0,17.0,5.5,24.0,40.0,12.36] | 2012 | 36x27 |
| <Null> | [31.9,10.5] | [-4.96,0.26,1.5,1.5,6.85,1.5,12.45,20.7] | [1.5,24.0,2,7.05,23.83,40.0,13.65,1.5,6.78] | 2012 | 36x27 |
| [51.0,1.5,3.0,4.0,510151,535447,61766,80738,248973,"Inset6 Text"] | [31.9,10.5] | [-4.96,0.26,2.0,1.5,2.0,3.94,1.5,10.33] | [2.0,24.0,1,6.28,23.83,51.0,17.08,6.39,18.21] | 2012 | 36x27 |
| [51.0,5.02,3.75,2.68,497389,498254,140526,141737,12672,"INSET 6"] | [31.8392,10.3765] | [-4.96,0.26,2.0,1.5,7.7,1.5,12.19,1.5] | [2.0,18.13,3,2.0,10.16,9.53,24.45,13.0,23.93] | 2012 | 36x27 |
| [10.55,21.63,3.17,5.05,494246,495061,122148,122659,6336,"INSET 6"] | [25.75,3.9] | [-4.96,0.26,2.0,5.67,2.0,8.07,2.0,1.5] | [2.0,24.0,3,2.0,16.0,9.5,20.0,51.0,23.93] | 2012 | 36x27 |

(Page Layout Elements Tables continued)

# Python Scripting

Can produce individual maps or batch production of PDFs

Updates CTCODE (town) in layer definition queries

Moves layout elements according to properties saved in Page Layout Elements Table (moves unwanted elements off the page)

Updates data-driven text:

- Town Map title block, production year, margin text, etc.
- Reads mileage data from primary data, processes it, and updates “Mileage Report” text elements

```
1  import arcpy, json, os, sys, time
2
3  arcpy.env.overwriteOutput = True
4  relPath = os.path.dirname(sys.argv[0])
5
6  #CURRENT - Get GP tool CTCODE value
7  inputValue = arcpy.GetParameterAsText(0)
8
9  #Function that arranges data frames based on PageLayoutElements table
10 def arrangeDFs(row, dfName, dfText, dfScaleText, dfScaleBar):
11   rowInfo = json.loads(row.getValue(dfName))
12   df = arcpy.mapping.ListDataFrames(mxd, dfName)[0]
13   df.elementPositionX = rowInfo[0]
14   df.elementPositionY = rowInfo[1]
15   df.elementHeight = rowInfo[2]
16   df.elementWidth = rowInfo[3]
17   newExtent = df.extent
18   newExtent.XMin = rowInfo[4]
19   newExtent.XMax = rowInfo[5]
20   newExtent.YMin = rowInfo[6]
21   newExtent.YMax = rowInfo[7]
22   df.extent = newExtent
23   #Must perform second time in 10.0 SP4
24   newExtent = df.extent
25   newExtent.XMin = rowInfo[4]
26   newExtent.XMax = rowInfo[5]
27   newExtent.YMin = rowInfo[6]
28   newExtent.YMax = rowInfo[7]
29   df.extent = newExtent
30   df.scale = rowInfo[8]
31   if not dfName == "MainDF":
32     dfText.text = rowInfo[9]
33     dfText.elementPositionX = df.elementPositionX
34 # next line modified since 2012-04-26 Moulton / 2012-6-1
35     dfText.elementPositionY = df.elementPositionY - 0.00
36     dfScaleText.elementPositionX = df.elementPositionX + df.elementWidth
```

# Suite of Python Scripts

## Core.py

Geoprocessing to make map layout according to PageLayoutElements table.

```
import arcpy, Toolbox2_Core

mxdPath = "CURRENT"
inputValue = arcpy.GetParameterAsText(0)

ctCodeList =[]
ctCodeList.append(inputValue)

Toolbox2_Core.mainScript(ctCodeList, mxdPath)

arcpy.RefreshActiveView()
```

Gateway Scripts: Generate lists of towns to be mapped by **Core.py**

**ZoomToPage.py**

(one town)

**ExportToPDF.py**

(batch of towns by year and layout size)

```
import arcpy, string, Toolbox2_Core

mxdPath = "CURRENT"
pageSize = arcpy.GetParameterAsText(0)
year = arcpy.GetParameterAsText(1)
ctCodeList = string.split(arcpy.GetParameterAsText(2), ";")

Toolbox2_Core.mainScript(ctCodeList, mxdPath, year)

arcpy.RefreshActiveView()
```

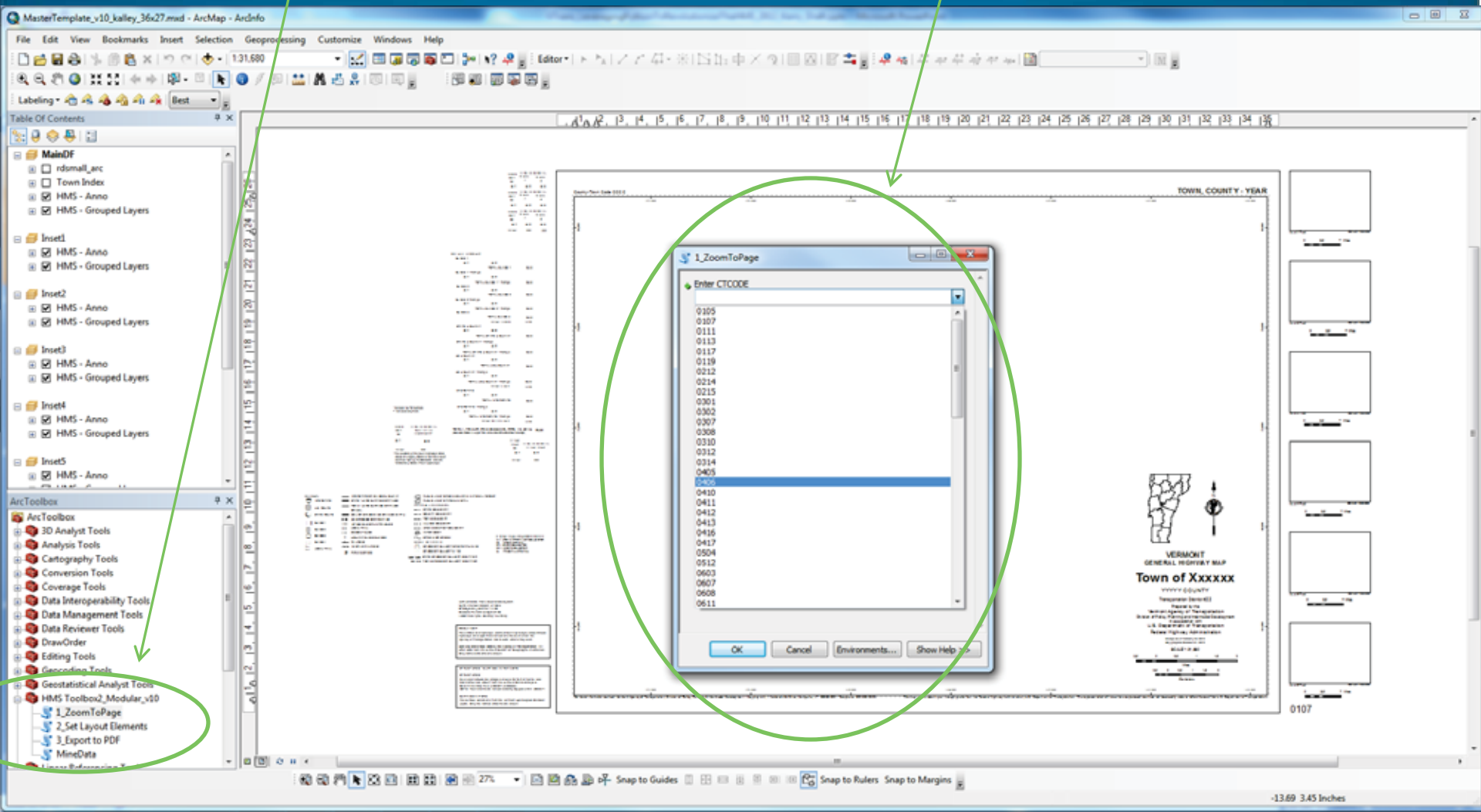
## SetLayoutInfo.py

Inserts or updates page layout information for a map in PageLayoutElements table based on current mxd layout.

# HMS Toolbox –Making the Map

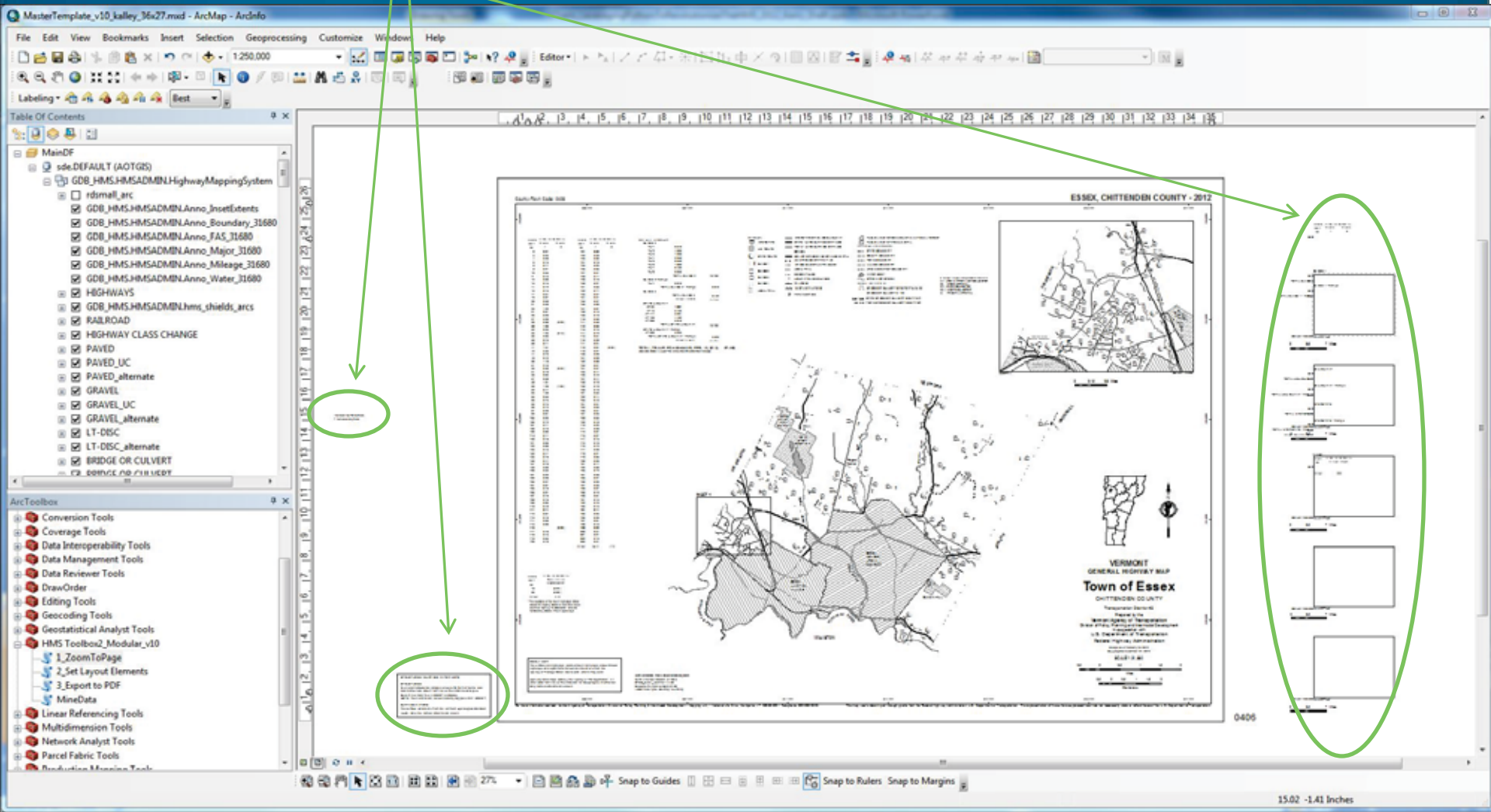
HMS Toolbox: ZoomToPage
Set Layout Elements
Export to PDF

ZoomToPage interface



# HMS Toolbox - ZoomToPage

Elements not used in layout



County-Town Code: 0406

# ESSEX, CHITTENDEN COUNTY - 2012

| TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 |
|---|---|---|
| 1 | 0.21 | |
| 3 | 0.25 | |
| 4 | 0.29 | |
| 5 | 0.15 | |
| 6 | 0.17 | |
| 9 | 0.21 | |
| 10 | 0.33 | |
| 11 | 0.43 | |
| 12 | 0.09 | |
| 13 | 0.15 | |
| 14 | 0.12 | |
| 15 | 0.15 | |
| 17 | 0.34 | |
| 18 | 0.07 | |
| 20 | 0.50 | |
| 21 | 0.50 | |
| 23 | 1.22 | |
| 24 | 0.91 | |
| 26 | 0.20 | |
| 27 | 3.20 | |
| 29 | 0.06 | (0.20) |
| 30 | 1.25 | |
| 32 | 0.23 | |
| 33 | 1.26 | (0.15) |
| 36 | 2.95 | |
| 38 | 0.75 | |
| 39 | 0.11 | |
| 41 | 1.34 | |
| 42 | 3.53 | |
| 44 | 0.76 | |
| 46 | 0.42 | |
| 50 | 1.10 | |
| 51 | 2.46 | |
| 53 | 0.30 | (0.55) |
| 54 | 0.10 | |
| 56 | 0.85 | |
| 57 | 0.39 | |
| 58 | 1.04 | |
| 60 | 1.20 | (1.95) |
| 62 | 0.47 | |
| 63 | 1.50 | |
| 65 | 0.35 | |
| 66 | 0.73 | |
| 85 | 0.13 | |
| 86 | 0.12 | |
| 87 | 0.29 | |
| 89 | 0.04 | |
| 105 | 0.23 | |
| 106 | 0.12 | |
| 107 | 0.11 | |
| 108 | 0.16 | |
| 109 | 0.09 | |
| 110 | 0.17 | |
| 120 | 0.10 | |
| 121 | 0.60 | |
| 122 | 0.08 | |
| 123 | 0.13 | |
| 132 | 0.47 | |
| 133 | 0.15 | |
| 136 | 0.47 | |
| 137 | 0.10 | |
| 138 | 0.08 | |
| 700 | 0.55 | |
| 701 | 0.22 | |
| 702 | 0.30 | |
| 703 | 0.37 | |
| 704 | 0.07 | |
| 705 | 0.18 | |
| 706 | 0.21 | |
| 707 | 0.10 | |
| 708 | 0.16 | |
| 709 | 0.05 | |
| 710 | 0.48 | |
| 711 | 0.14 | |
| 712 | 0.07 | |
| 713 | 0.10 | |
| 714 | 0.68 | |
| 715 | 0.08 | |
| 716 | | (0.20) |
| 717 | 0.70 | |
| 718 | 0.15 | |
| 719 | 0.35 | |
| 720 | 0.19 | |
| 721 | 0.82 | |
| 722 | 0.39 | |
| 723 | 0.06 | |
| 724 | 0.06 | |
| 725 | 0.22 | |
| 726 | 0.05 | |
| 727 | 0.31 | |
| 728 | 0.11 | |
| 729 | 0.18 | |
| 730 | 0.27 | |
| 731 | 0.55 | |
| 732 | 0.11 | |
| 733 | 0.57 | |
| 734 | 0.07 | |
| 736 | 0.37 | |
| 736 | 0.06 | |
| 737 | 0.07 | |
| 738 | 0.13 | |
| 739 | 0.18 | |
| 740 | 0.38 | |
| 741 | 0.39 | |
| 742 | 0.65 | |
| 743 | 0.15 | |
| 744 | 0.72 | |
| 745 | 0.34 | |
| 746 | 0.20 | |
| 747 | 0.24 | |
| 748 | 0.04 | (0.05) |
| 749 | 0.27 | |
| 750 | 0.28 | |
| 751 | 0.29 | |
| 752 | 0.09 | |
| 753 | 0.31 | |
| 754 | 0.67 | |
| 755 | 0.41 | |
| 756 | 0.42 | |
| 757 | 0.44 | |
| 758 | 0.19 | |
| 759 | 0.19 | |
| 760 | 0.19 | |
| 761 | 0.35 | |
| 762 | 0.14 | |
| 763 | 0.43 | |
| 764 | 0.34 | |
| 765 | 0.65 | |
| 766 | 0.54 | |
| 767 | 0.23 | |
| 768 | 0.65 | |
| 769 | 0.49 | |
| 770 | 0.02 | |
| 771 | 0.28 | |
| 772 | 0.07 | |
| 773 | 0.07 | |
| 774 | 0.13 | |
| 775 | 0.10 | |
| 776 | 0.72 | |
| 777 | 0.29 | |
| 778 | 0.21 | |
| 779 | 0.05 | |
| 780 | 0.26 | |
| 781 | 0.17 | |
| 782 | 0.08 | |
| 783 | 0.12 | |
| 784 | 0.29 | |
| 785 | 0.27 | |
| 786 | 0.26 | |
| 787 | 0.36 | |
| 788 | 0.07 | |
| 789 | 0.12 | |
| 790 | 0.04 | |
| 791 | 0.13 | |
| 792 | 0.76 | |
| 793 | 0.13 | |
| 794 | 0.14 | |
| 795 | 0.23 | |
| 796 | 0.26 | |
| 797 | 0.04 | |
| 798 | 0.43 | |
| 799 | 0.22 | |
| 800 | 0.34 | |
| 801 | 0.21 | |
| 802 | 0.13 | |
| 803 | 0.31 | |
| TOTAL | 84.22 | 3.19 |

| TOWN HWY. No. | LENGTH IN MILES "NOT UP TO STANDARD" |
|---|---|
| 15 | (0.22) |
| 66 | (0.08) |
| TOTAL | 0.30 |

* The sections of the town highways listed above are legally Class 3, but have been deemed "Not Up To Standard" and are functionally Class 4 Town Highways.

**MILEAGE SUMMARY**

| | | |
|---|---|---|
| CLASS 2 | | |
| TH-1 | 0.340 | |
| TH-2 | 4.000 | |
| TH-3 | 1.260 | |
| TH-4 | 2.250 | |
| TH-5 | 0.550 | |
| TH-6 | 1.000 | |
| TH-7 | 0.460 | |
| TH-8 | 0.930 | |
| TOTAL CLASS 2 | | 10.790 |
| CLASS 2- Ramps | | |
| TH-4 | 0.040 | |
| TOTAL CLASS 2 - Ramps | | 0.040 |
| CLASS 3 | | |
| TOTAL CLASS 3 | | 64.32 |
| TOTAL TOWN | | 75.150 |
| STATE HIGHWAY | | |
| VT-2A | 1.807 | |
| VT-15 | 5.436 | |
| VT-117 | 3.204 | |
| VT-128 | 4.402 | |
| VT-289 | 3.940 | |
| TOTAL STATE HIGHWAY | | 18.789 |
| STATE HIGHWAY - Ramps | | |
| VT-289 | 3.523 | |
| TOTAL STATE HIGHWAY - Ramps | | 3.523 |
| TOTAL STATE | | 22.312 |

**TOTAL TRAVELED HIGHWAYS, FEB. 10, 2012:** 97.462
(Excludes Class 4, Legal Trail, and Unidentified Corridor Mileage)

**HIGHWAYS**

- INTERSTATE
- U.S. ROUTE
- STATE ROUTE
- CLASS 1
- CLASS 2
- CLASS 3
- CLASS 4
- LEGAL TRAIL

- INTERSTATE OR DIVIDED HIGHWAY
- STATE - HARD SURFACE OR PAVED
- TOWN - HARD SURFACE OR PAVED
- GRAVEL
- SOIL OR GRADED AND DRAINED EARTH
- UNIMPROVED OR PRIMITIVE
- IMPASSABLE OR UNTRAVELED
- LEGAL TRAIL
- DISCONTINUED
- HIGHWAY CLASS CHANGE
- RAILROAD
- INACTIVE RAILROAD
- P PARK AND RIDE

- PUBLIC LAND - GREEN MOUNTAIN NATIONAL FOREST
- PUBLIC LAND - STATE/MUNICIPAL

**POLITICAL SUBDIVISIONS**

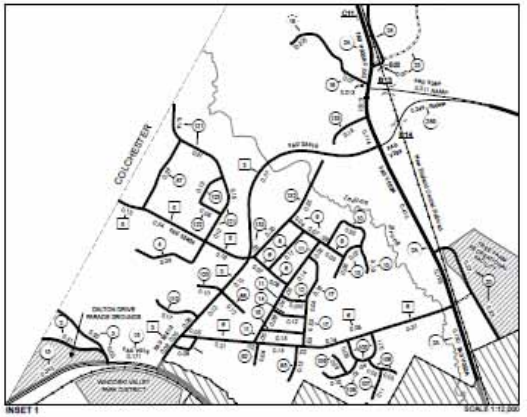
- STATE BOUNDARY
- COUNTY BOUNDARY
- TOWN BOUNDARY
- VILLAGE BOUNDARY
- URBAN COMPACT BOUNDARY
- WATER BODY
- STREAM OR BROOK

**BRIDGE OR CULVERT**

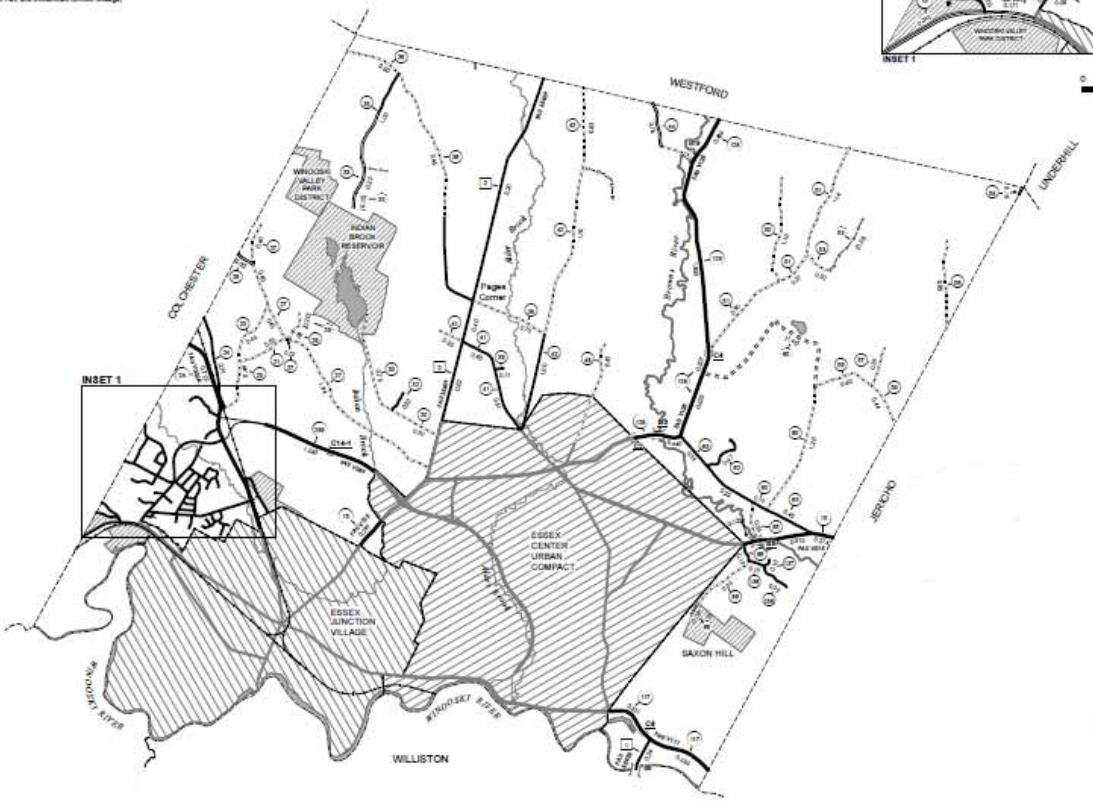
- BRIDGE OR CULVERT GREATER THAN 20'
- BRIDGE OR CULVERT 8' - 20'

B34 / C34 STATE BRIDGE OR CULVERT IDENTIFIER
B34 / C34 TOWN BRIDGE OR CULVERT IDENTIFIER

**FEDERAL CLASSIFICATION IDENTIFIER**
RAU URBAN/RURAL OR COLLECTOR
MA MINOR ARTERIAL
MAC MAJOR COLLECTOR
MIC MINOR COLLECTOR
PA PRINCIPAL ARTERIAL




0 0.15 0.3 Miles



## VERMONT GENERAL HIGHWAY MAP

# Town of Essex

CHITTENDEN COUNTY

Transportation District #5

Prepared by the
Vermont Agency of Transportation
Division of Policy, Planning and Intermodal Development
In cooperation with
U.S. Department of Transportation
Federal Highway Administration

Mileage as of February 10, 2012
Map prepared September 26, 2012

SCALE 1:31,680

0.5 0 0.5 1 1.5 2
Miles
0.5 0 0.5 1 1.5 2
Kilometers

**DISCLAIMER:**
The untravelled highways (laid-out town highways), discontinued highways, and legal trails hereon are those of which the Agency of Transportation has record; others may exist.

Highway and bridge data by the Agency of Transportation. All other data from the Vermont Center for Geographic Information. Only named streams are shown.

Vermont State Plane Coordinate System
North American Datum of 1983
SPCS_Zone_Identifier: 4400
Geodetic Reference System 80
4,000-meter grid, Easting - Northing

For more information contact: Vermont Agency of Transportation, Division of Policy, Planning & Intermodal Development - Mapping Unit, 1 National Life Drive, Montpelier, VT 05633-5001 Telephone: 802-828-3600

This map was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The representation of the authors expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

County-Town Code: 0406

# ESSEX, CHITTENDEN COUNTY - 2012

legend

ramps

2 columns

| TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 | TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 |
|---|---|---|---|---|---|
| 1 | 0.21 | | 721 | 0.82 | |
| 3 | 0.25 | | 722 | 0.39 | |
| 4 | 0.29 | | 723 | 0.06 | |
| 5 | 0.18 | | 724 | 0.32 | |
| 6 | 0.17 | | 725 | 0.22 | |
| 9 | 0.21 | | 726 | 0.05 | |
| 10 | 0.33 | | 727 | 0.31 | |
| 11 | 0.43 | | 728 | 0.11 | |
| 12 | 0.09 | | 729 | 0.18 | |
| 13 | 0.15 | | 730 | 0.27 | |
| 14 | 0.12 | | 731 | 0.55 | |
| 15 | 0.15 | | 732 | 0.11 | |
| 17 | 0.34 | | 733 | 0.57 | |
| 18 | 0.07 | | 734 | 0.33 | |
| 20 | 0.50 | | 735 | 0.37 | |
| 21 | 0.50 | | 736 | 0.08 | |
| 23 | 1.22 | | 737 | 0.07 | |
| 24 | 0.91 | | 738 | 0.13 | |
| 26 | 0.20 | | 739 | 0.18 | |
| 27 | 3.20 | | 740 | 0.38 | |
| 29 | 0.06 | (0.20) | 741 | 0.39 | |
| 30 | 1.25 | | 742 | 0.65 | |
| 32 | 0.23 | | 743 | 0.15 | |
| 33 | 1.26 | (0.15) | 744 | 0.72 | |
| 36 | 2.95 | | 745 | 0.34 | |
| 38 | 0.75 | | 746 | 0.20 | |
| 39 | 0.11 | | 747 | 0.24 | |
| 41 | 1.34 | | 748 | 0.04 | (0.05) |
| 42 | 3.53 | | 749 | 0.27 | |
| 44 | 0.76 | | 750 | 0.28 | |
| 46 | 0.43 | | 751 | 0.29 | |
| 50 | 1.10 | | 752 | 0.09 | |
| 51 | 2.46 | | 753 | 0.31 | |
| 53 | 0.30 | (0.55) | 754 | 0.67 | |
| 54 | 0.10 | | 755 | 0.41 | |
| 56 | 0.66 | | 756 | 0.42 | |
| 57 | 0.39 | | 757 | 0.44 | |
| 58 | 1.04 | | 758 | 0.19 | |
| 60 | 1.20 | (1.95) | 759 | 0.19 | |
| 62 | 0.47 | | 760 | 0.19 | |
| 63 | 1.50 | | 761 | 0.35 | |
| 65 | 0.36 | | 762 | 0.14 | |
| 66 | 0.73 | | 763 | 0.43 | |
| 85 | 0.13 | | 764 | 0.34 | |
| 86 | 0.12 | | 765 | 0.65 | |
| 87 | 0.29 | | 766 | 0.54 | |
| 90 | 0.04 | | 767 | 0.33 | |
| 105 | 0.23 | | 768 | 0.65 | |
| 106 | 0.12 | | 769 | 0.49 | |
| 107 | 0.11 | | 770 | 0.02 | |
| 108 | 0.16 | | 771 | 0.28 | |
| 109 | 0.09 | | 772 | 0.07 | |
| 110 | 0.17 | | 773 | 0.07 | |
| 120 | 0.10 | | 774 | 0.13 | |
| 121 | 0.60 | | 775 | 0.10 | |
| 122 | 0.08 | | 776 | 0.12 | |
| 123 | 0.13 | | 777 | 0.29 | |
| 132 | 0.47 | | 778 | 0.21 | |
| 133 | 0.13 | | 779 | 0.05 | |
| 136 | 0.47 | | 780 | 0.26 | |
| 137 | 0.10 | | 781 | 0.17 | |
| 138 | 0.08 | | 782 | 0.08 | |
| 700 | 0.55 | | 783 | 0.10 | |
| 701 | 0.22 | | 784 | 0.29 | |
| 702 | 0.30 | | 785 | 0.27 | |
| 703 | 0.37 | | 786 | 0.26 | |
| 704 | 0.07 | | 787 | 0.36 | |
| 705 | 0.18 | | 788 | 0.07 | |
| 706 | 0.21 | | 789 | 0.13 | |
| 707 | 0.10 | | 790 | 0.04 | |
| 708 | 0.16 | | 791 | 0.13 | |
| 709 | 0.05 | | 792 | 0.76 | |
| 710 | 0.48 | | 793 | 0.13 | |
| 711 | 0.14 | | 794 | 0.14 | |
| 712 | 0.07 | | 795 | 0.23 | |
| 713 | 0.10 | | 796 | 0.28 | |
| 714 | 0.68 | | 797 | 0.04 | |
| 715 | 0.08 | | 798 | 0.43 | |
| 716 | | (0.20) | 799 | 0.22 | |
| 717 | 0.70 | | 800 | 0.34 | |
| 718 | 0.15 | | 801 | 0.21 | |
| 719 | 0.35 | | 802 | 0.13 | |
| 720 | 0.19 | | 803 | 0.31 | |
| | | | TOTAL | 64.31 | 3.19 |

| TOWN HWY. No. | LENGTH IN MILES "NOT UP TO STANDARD" |
|---|---|
| 15 | (0.22) |
| 85 | (0.08) |
| TOTAL | 0.30 |

* The sections of the town highways listed above are legally Class 3, but have been deemed "Not Up To Standard" and are functionally Class 4 Town Highways

**MILEAGE SUMMARY**

| | | |
|---|---|---|
| CLASS 2 | | |
| TH-1 | 0.340 | |
| TH-2 | 4.000 | |
| TH-3 | 1.260 | |
| TH-4 | 2.250 | |
| TH-5 | 0.680 | |
| TH-6 | 1.000 | |
| TH-7 | 0.460 | |
| TH-8 | 0.930 | |
| TOTAL CLASS 2 | | 10.790 |
| CLASS 2- Ramps | | |
| TH-4 | 0.040 | |
| TOTAL CLASS 2 - Ramps | 0.040 | |
| TOTAL CLASS 3 | | 64.32 |
| TOTAL TOWN | | 75.150 |
| STATE HIGHWAY | | |
| VT-2A | 1.807 | |
| VT-15 | 5.436 | |
| VT-117 | 3.204 | |
| VT-128 | 4.402 | |
| VT-289 | 3.940 | |
| TOTAL STATE HIGHWAY | | 18.709 |
| STATE HIGHWAY - Ramps | | |
| VT-289 | 3.523 | |
| TOTAL STATE HIGHWAY - Ramps | | 3.523 |
| TOTAL STATE | | 22.312 |

TOTAL TRAVELED HIGHWAYS, FEB. 10, 2012: 97.462
(Excludes Class 4, Legal Trail, and Unidentified Corridor Mileage)

**HIGHWAYS**
- INTERSTATE
- U.S. ROUTE
- STATE ROUTE
- CLASS 1
- CLASS 2
- CLASS 3
- CLASS 4
- LEGAL TRAIL

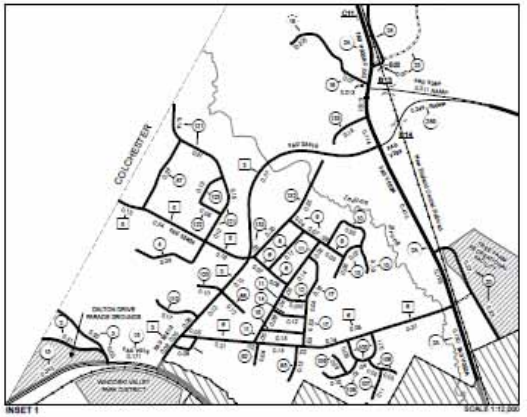
- INTERSTATE OR DIVIDED HIGHWAY
- STATE - HARD SURFACE OR PAVED
- TOWN - HARD SURFACE OR PAVED
- GRAVEL
- SOIL OR GRADED AND DRAINED EARTH
- UNIMPROVED OR PRIMITIVE
- IMPASSABLE OR UNTRAVELED
- LEGAL TRAIL
- DISCONTINUED
- HIGHWAY CLASS CHANGE
- RAILROAD
- INACTIVE RAILROAD
- P PARK AND RIDE

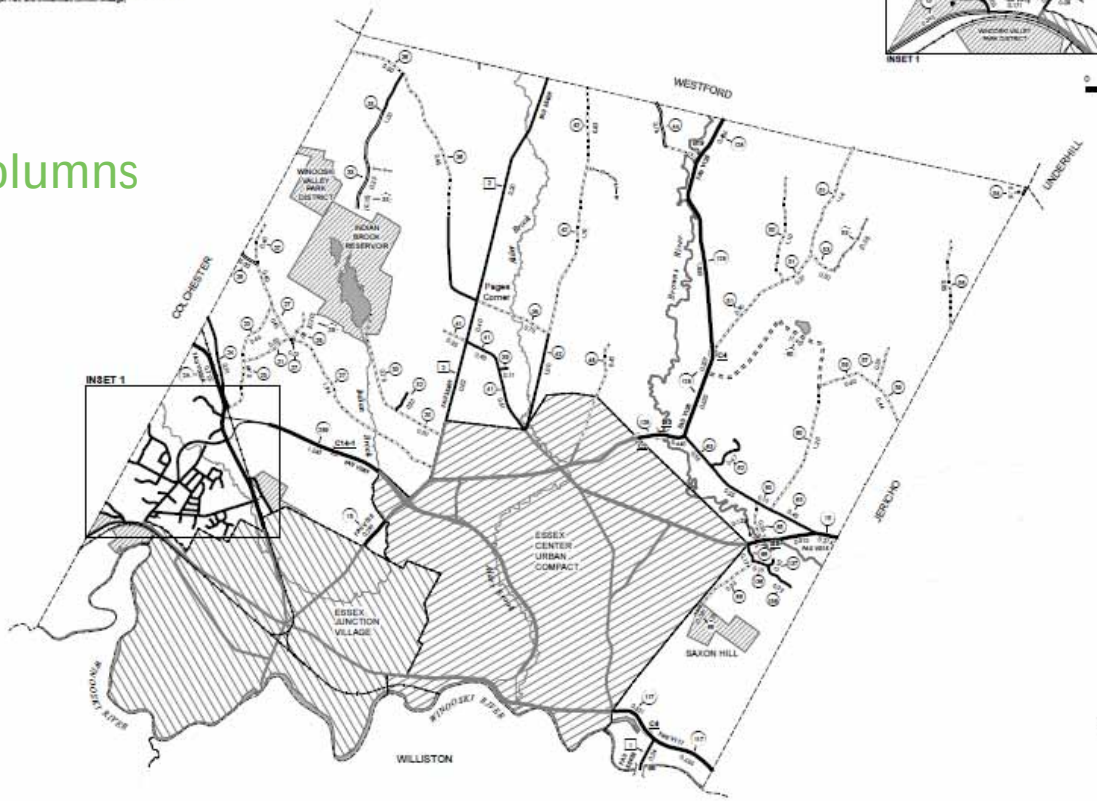
- PUBLIC LAND - GREEN MOUNTAIN NATIONAL FOREST
- PUBLIC LAND - STATE/MUNICIPAL

**POLITICAL SUBDIVISIONS**
- STATE BOUNDARY
- COUNTY BOUNDARY
- TOWN BOUNDARY
- VILLAGE BOUNDARY
- URBAN COMPACT BOUNDARY
- WATER BODY
- STREAM OR BROOK

**BRIDGE OR CULVERT**
- BRIDGE OR CULVERT GREATER THAN 20'
- BRIDGE OR CULVERT 8' - 20'
- B34 / C34 STATE BRIDGE OR CULVERT IDENTIFIER
- B34 / C34 TOWN BRIDGE OR CULVERT IDENTIFIER

**FEDERAL CLASSIFICATION IDENTIFIER**
- RAU URBAN/RURAL OR COLLECTOR
- MA MINOR ARTERIAL
- MAC MAJOR COLLECTOR
- MIC MINOR COLLECTOR
- PA PRINCIPAL ARTERIAL



## VERMONT GENERAL HIGHWAY MAP

# Town of Essex

CHITTENDEN COUNTY

Transportation District #5

Prepared by the
Vermont Agency of Transportation
Division of Policy, Planning and Intermodal Development
In cooperation with
U.S. Department of Transportation
Federal Highway Administration

Mileage as of February 10, 2012
Map prepared September 26, 2012

SCALE 1:31,580

0.5 0 0.5 1 1.5 2
Miles
0.5 0 0.5 1 1.5 2
Kilometers

**DISCLAIMER:**
The untravelled highways (laid-out town highways), discontinued highways, and legal trails hereon are those of which the Agency of Transportation has record; others may exist.

Highway and bridge data by the Agency of Transportation. All other data from the Vermont Center for Geographic Information. Only named streams are shown.

Vermont State Plane Coordinate System
North American Datum of 1983
SPCS_Zone_Identifier: 4400
Geodetic Reference System 80
4,000-meter grid, Easting - Northing

For more information contact: Vermont Agency of Transportation, Division of Policy, Planning & Intermodal Development - Mapping Unit, 1 National Life Drive, Montpelier, VT 05633-5001 Telephone: 802-828-3600

This map was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The representation of the authors expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

County-Town Code: 1416

# ROYALTON, WINDSOR COUNTY - 2012

three columns

| TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 | TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 | TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 |
|---|---|---|---|---|---|---|---|---|
| 5 | 3.81 | | 41 | 0.71 | | 73 | 0.10 | |
| 7 | 2.96 | | 42 | 1.05 | | 74 | 0.07 | |
| 8 | 0.40 | | 43 | 0.41 | (0.49) | 75 | 0.20 | |
| 9 | 1.32 | | 44 | 0.16 | | 76 | 0.17 | |
| 10 | 0.46 | | 45 | 0.80 | | 77 | | (0.07) |
| 11 | 1.29 | | 46 | 0.65 | (1.30) | 78 | 0.21 | |
| 12 | 2.33 | | 47 | 2.33 | | 80 | 0.12 | |
| 13 | 3.22 | | 48 | 1.19 | | 81 | 0.16 | |
| 14 | 1.28 | | 49 | 2.40 | | 82 | 0.36 | |
| 15 | 0.38 | (1.31) | 50 | 0.10 | | 83 | 0.12 | |
| 16 | 0.66 | (0.60) | 51 | 0.42 | | 84 | 0.08 | |
| 17 | 2.38 | | 52 | 0.20 | | 85 | 0.32 | |
| 18 | 0.80 | | 53 | 0.20 | (0.59) | 86 | 0.21 | |
| 20 | 0.50 | | 54 | 0.31 | | 87 | 0.23 | |
| 21 | | (0.70) | 55 | 0.28 | | 88 | 0.11 | |
| 22 | 1.94 | | 56 | 0.60 | | 89 | 0.25 | |
| 23 | 1.46 | | 57 | 0.04 | | 92 | 0.04 | |
| 24 | 0.14 | | 58 | 0.03 | | 93 | 0.07 | |
| 25 | 0.83 | | 59 | 0.11 | | 94 | 0.05 | |
| 26 | 0.10 | | 60 | 0.06 | | 95 | 0.26 | |
| 27 | 0.15 | | 61 | 0.07 | | 96 | 0.10 | |
| 28 | 0.15 | | 62 | 0.41 | | 97 | 0.11 | |
| 29 | 0.51 | | 63 | 0.09 | | 98 | 0.20 | |
| 30 | 0.30 | | 64 | 0.05 | | 99 | 0.13 | |
| 32 | 0.44 | | 65 | 0.10 | | 100 | 0.18 | |
| 33 | 0.15 | | 66 | 0.12 | | 101 | 0.16 | |
| 34 | 0.24 | | 67 | 0.61 | | 102 | | (0.44) |
| 35 | 3.03 | | 68 | 0.21 | | 103 | | (0.05) |
| 36 | 2.36 | | 69 | 0.08 | | 104 | | (0.58) |
| 37 | 0.68 | (1.31) | 70 | 0.05 | | 105 | | (1.21) |
| 38 | 3.57 | | 71 | 0.04 | | 106 | | (0.14) |
| 39 | | (0.70) | 72 | 0.06 | | TOTAL | 55.79 | 9.51 |

no ramps

**MILEAGE SUMMARY**

| | | |
|---|---|---|
| CLASS 2 | | |
| TH-1 | 2.590 | |
| TH-2 | 2.540 | |
| TH-3 | 1.540 | |
| TH-4 | 2.220 | |
| TH-5 | 2.050 | |
| TH-6 | 4.130 | |
| TH-7 | 0.340 | |
| TOTAL CLASS 2 | | 15.410 |
| CLASS 3 | | |
| TOTAL CLASS 3 | | 55.79 |
| **TOTAL TOWN** | | **71.200** |
| STATE HIGHWAY | | |
| VT-14 | 9.121 | |
| VT-107 | 2.530 | |
| VT-110 | 2.320 | |
| TOTAL STATE HIGHWAY | | 13.971 |
| **TOTAL STATE** | | **13.971** |
| INTERSTATE | | |
| I-89 | 7.720 | |
| TOTAL INTERSTATE | | 7.720 |
| INTERSTATE - Ramps | | |
| I-89 | 1.266 | |
| TOTAL INTERSTATE - Ramps | | 1.266 |
| **TOTAL INTERSTATE** | | **8.986** |

**TOTAL, TRAVELED HIGHWAYS, FEB. 10, 2012: 94.167**

(Includes Class 4, Legal Trail, and Unidentified Corridor Mileage)

| TOWN HWY. No. | LENGTH IN MILES "NOT UP TO STANDARD" |
|---|---|
| 37 | (0.07) |
| 46 | (0.18) |
| TOTAL | 0.25 |

* The sections of the town highways listed above are legally Class 3, but have been deemed "Not Up To Standard" and are functionally Class 4 Town Highways

legend

HIGHWAYS
- INTERSTATE — INTERSTATE OR DIVIDED HIGHWAY
- U.S. ROUTE — STATE - HARD SURFACE OR PAVED
- STATE ROUTE — TOWN - HARD SURFACE OR PAVED
- CLASS 1 — GRAVEL
- CLASS 2 — SOIL OR GRADED AND DRAINED EARTH
- CLASS 3 — UNIMPROVED OR PRIMITIVE
- CLASS 4 — IMPASSABLE OR UNTRAVELED
- LEGAL TRAIL — LEGAL TRAIL
- DISCONTINUED
- HIGHWAY CLASS CHANGE
- RAILROAD
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- P — PARK AND RIDE

PUBLIC LAND - GREEN MOUNTAIN NATIONAL FOREST
PUBLIC LAND - STATE/MUNICIPAL

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- WATER BODY
- STREAM OR BROOK

BRIDGE OR CULVERT
- BRIDGE OR CULVERT GREATER THAN 20' BRIDGE OR CULVERT 8' - 20'
- B34 / C34 — STATE BRIDGE OR CULVERT IDENTIFIER
- B34 / C34 — TOWN BRIDGE OR CULVERT IDENTIFIER

FEDERAL CLASSIFICATION DESIGNER
PA12 URBAN ARTERIAL OR COLLECTOR
MA MINOR ARTERIAL
MJC MAJOR COLLECTOR
MNC MINOR COLLECTOR
PA PRINCIPAL ARTERIAL

DISCLAIMER:
The untravelled highways (laid-out town highways, proposed highways, and legal trails hereon are those of which the Agency of Transportation has record; others may exist.

Highway and bridge data by the Agency of Transportation. All other data from the Vermont Center for Geographic Information. Only named streams are shown.

Vermont State Plane Coordinate System
North American Datum of 1983
SPCS_Zone_Identifier: 4400
Geodetic Reference System: 80
4,000-meter grid, Easting - Northing

INSET 1 SCALE 1:12,672 — 0 0.15 0.3 Miles

ROYALTON INSET 2 SCALE 1:6,336 — 0 0.085 0.17 Miles

INSET 4 SCALE 1:6,336 — 0 0.085 0.17 Miles

INSET 5 SCALE 1:6,336 — 0 0.085 0.17 Miles

SOUTH ROYALTON INSET 3 SCALE 1:6,336 — 0 0.09 0.18 Miles

BROAD BROOK INSET 6 SCALE 1:12,672 — 0 0.15 0.3 Miles

RANDOLPH · ORANGE COUNTY · TUNBRIDGE · STRAFFORD · BETHEL · SHARON · BARNARD · POMFRET

INSET 1 · ROYALTON INSET 2 · INSET 4 · INSET 5 · SOUTH ROYALTON INSET 3 · BROAD BROOK INSET 6

ROYALTON TOWN FOREST · SOUTH ROYALTON TOWN FOREST · WHITE RIVER · FIRST BRANCH · SECOND BRANCH · Mcintosh Pond

## VERMONT
## GENERAL HIGHWAY MAP
# Town of Royalton
WINDSOR COUNTY

Transportation District #4

Prepared by the
Vermont Agency of Transportation
Division of Policy, Planning and Intermodal Development
in cooperation with
U.S. Department of Transportation
Federal Highway Administration

Mileage as of February 10, 2012
Map prepared October 01, 2012

SCALE 1:31,680

0.5 0 0.5 1 1.5 2 Miles

0.5 0 0.5 1 1.5 2 Kilometers

For more information contact: Vermont Agency of Transportation, Division of Policy, Planning & Intermodal Development - Mapping Unit, 1 National Life Drive, Montpelier, VT 05633-5001 Telephone: 802-828-2600.

This map was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The representation of the authors expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

# Other HMS Templates/Scripts

Eleven templates:

- Paper size (27 x 36, 36 x 27, 36 x 30, 36 x 36, 48 x 36)
- Town, Village, Urban Compact, City

Requires Additional Templates

Four versions of scripts:

- Town, Village, Urban Compact, City

Different templates/scripts facilitated:

- Simpler script for most maps (fewer conditional statements)
- Legend flexibility
- Map rotation, Definition Queries, etc.

# Additional Variations

## Class 3 & 4 Town Highway Mileage Summaries:

### Village

| TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 | TOWN ROAD NAME |
|---|---|---|---|
| 30 | 0.07 | | NORTHRIDGE RD |
| 32 | 0.43 | | SCHOOL ST |
| 33 | 0.10 | | BRIDGE ST |
| 34 | 0.20 | | CHURCH ST |
| 35 | 0.13 | | HIGH ST |
| 36 | 0.16 | | DEPOT ST |
| 53 | 0.05 | | POST OFFICE RD |
| 54 | 0.03 | | TH 32 |
| 54 | | (0.12) | CHASE HILL RD |

Summarized by Town Highway Number *and* Road Name

### Town

| TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 | TOWN HWY. No. | LENGTH IN MILES CLASS 3 | CLASS 4 |
|---|---|---|---|---|---|
| 2 | 0.21 | | 721 | 0.82 | |
| 3 | 0.25 | | 722 | 0.39 | |
| 4 | 0.29 | | 723 | 0.06 | |
| 6 | 0.15 | | 724 | 0.10 | |
| 8 | 0.17 | | 725 | 0.22 | |
| 9 | 0.21 | | 726 | 0.05 | |
| 10 | 0.33 | | 727 | 0.31 | |
| 11 | 0.43 | | 728 | 0.11 | |
| 12 | 0.09 | | 729 | 0.18 | |
| 13 | 0.15 | | 730 | 0.27 | |
| 14 | 0.12 | | 731 | 0.55 | |
| 15 | 0.15 | | 732 | 0.11 | |
| 17 | 0.34 | | 733 | 0.57 | |
| 18 | 0.07 | | 734 | 0.31 | |
| 20 | 0.50 | | 735 | 0.37 | |
| 21 | 0.50 | | 736 | 0.06 | |
| 23 | 1.22 | | 737 | 0.07 | |
| 24 | 0.91 | | 738 | 0.13 | |
| 26 | 0.20 | | 739 | 0.18 | |
| 27 | 3.20 | | 740 | 0.38 | |
| 29 | 0.08 | (0.20) | 741 | 0.39 | |
| 30 | 1.25 | | 742 | 0.55 | |
| 32 | 0.23 | | 743 | 0.15 | |
| 33 | 1.25 | (0.15) | 744 | 0.72 | |
| 36 | 2.95 | | 745 | 0.34 | |

# The Transition – Building New Maps

Two approaches used to upgrade to the new system:

Extract size, position, and extent of the Main Map and Inset data frames from the mxds of recent editions of Maps:

- Python script opens mxd, obtains desired parameters, and provides a string output that can be copied and pasted into PageLayoutElements table

Start from scratch to develop layout:

- Open template, select town, and run HMS script to create a default layout
- Manually set Data Frame extents and move elements to desired layout positions
- Run a script that dumps updated layout parameters into PageLayoutElements Table

# Benefits of the New HMS

One Core MXD Structure and Scripts

Data Driven Reports – if Data is correct, Report is correct

Significant efficiencies and cutting 2 months out of the process

More Rigorous QA/QC on data and full use of data

Resolution of issues in data that we didn't know existed

System should be compatible with the next version of ArcGIS and works at the ArcView level (ArcGIS Basic)

Implemented the new system and produced the maps faster in 2012, than in a standard year with the old process

# Multiple Element Layout Manager 10.0 v1

The ESRI Map Automation Team has posted a developer sample on the Resource Center. So, you too can leverage Python to generate a custom map series.

The Multiple Element Layout Manager 10.0 v1 provides the same Python functionality that is used to generate the Town Highway Map Series.

**http://esriurl.com/5907**

# Questions???

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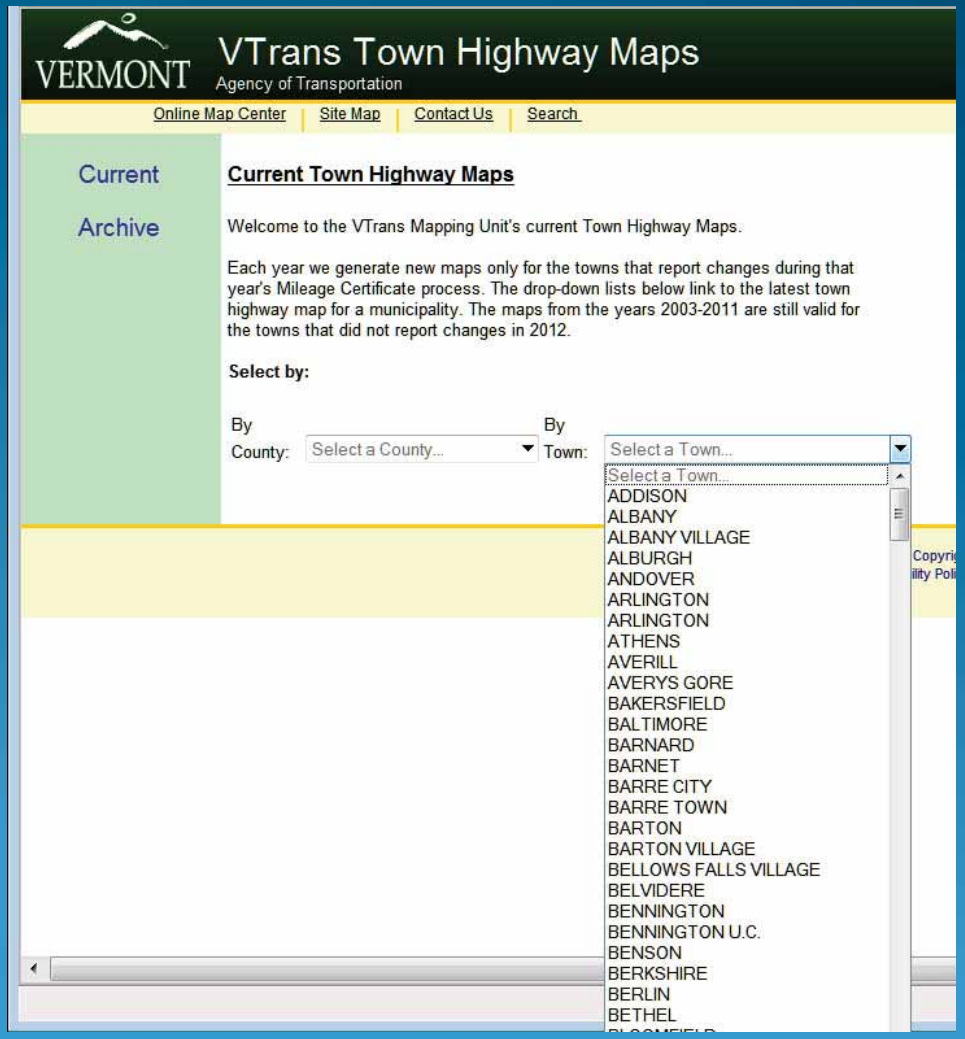
VT Agency of Transportation
Policy, Planning & Intermodal Development Division - Mapping Unit




Town Highway Maps on-line at the following link:
http://vtransplanning.vermont.gov/maps/town_maps