

2016 Spring NCMUG Meeting

Wednesday, May 11, 2016

10:00 a.m. – 12:00 p.m.

Room Triad Ballroom West, Greensboro Downtown Marriott

304 N. Greene Street, Greensboro, North Carolina 27401

- **MODEL OUTPUT VISUALIZATION**

Using Data to Help Tell the Story: Emerging Trends in Data Delivery and Analysis Tools and Techniques to Improve Model Resolution (30 minutes)

Leta Huntsinger, Rhett Fussell, Kyle Ward, and Greg Macfarlane, WSP Parsons Brinckerhoff, Systems Analysis Group

Deliverables Reborn

Leta Huntsinger, Kyle Ward, and Greg Macfarlane

May 13, 2016

<https://pbsag.github.io/marketing/DeliverablesReborn.html>

Introduction

For the past 50 years, we have been giving you essentially the same products... the tools have changed, but let's face it; it is essentially the same thing. We deliver the model files first on:

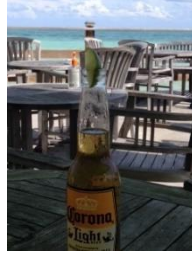
- Floppy disk
- DVD
- Jump drive

We deliver our user's guides and model documentation like this (holds up a stapled report) Our technical memos like this (another report). And our presentations are either static images, or sometimes we figure out a way to embed some animations into them.

The graphics in our documents are static, both from the standpoint of not changing over time, and from the standpoint of not allowing you to interface with them.

And don't even get me started on how we archive and access model data. I can't tell you the number of conversations I have had as a client, with clients, with other consultants around the issue of "do we have the latest and greatest model files, are these the official model files, what happened since the last update.... you know what I'm saying, I bet more than half of you in this room have had the same or similar conversations.

We have invested a lot of time and energy into exploring ways that we can make things better, and we think that we are onto something...



KEY WEST... oh wait, that's the wrong picture... well maybe not for me and Rhett, as we have hired the right people that can change the paradigm for how we do model delivery giving us time to think about retiring in Key West.

HTML-based Deliverables

HTML-based deliverables allow for two important improvements over deliverables developed in office productivity software (like Microsoft Office).

1. The images and graphics can be interactive, allowing reviewers and the public to explore narratives that are important to them, and not to simply rely on the narrative that the consultant wishes to share.
2. The code to run the analysis can be embedded in the deliverable, instead of buried in spreadsheets.

In this section, we demonstrate both of these techniques.

Delivery through Git and GitHub

We are recommending to our clients that they use [GitHub](#) to manage their model development and documentation. This allows them to

- track changes to software
- merge changes between collaborators
- manage contributors
- distribute releases
- report and track issues
- integrate documentation and model software

A complete introduction to git and GitHub is beyond the scope of this document, but there is a [series of online guides](#) to get you started, and you can browse travel model software from agencies that have already moved to this model.

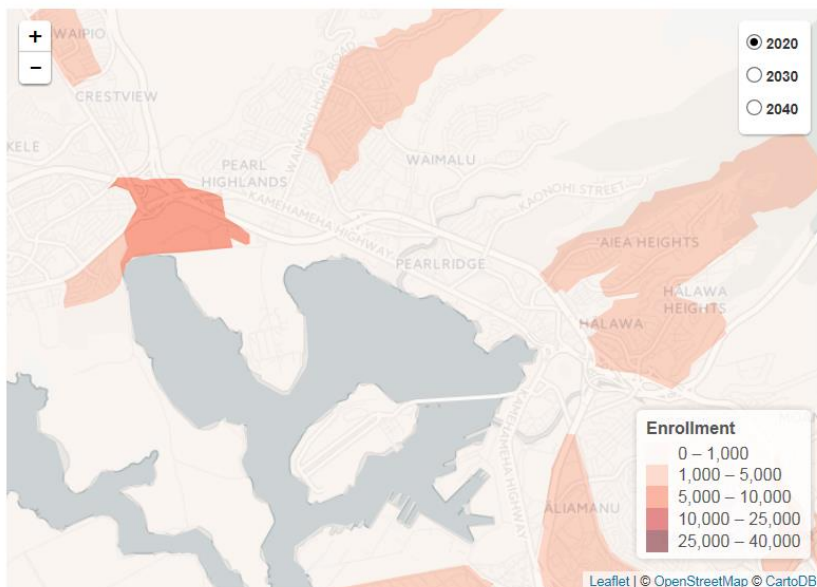
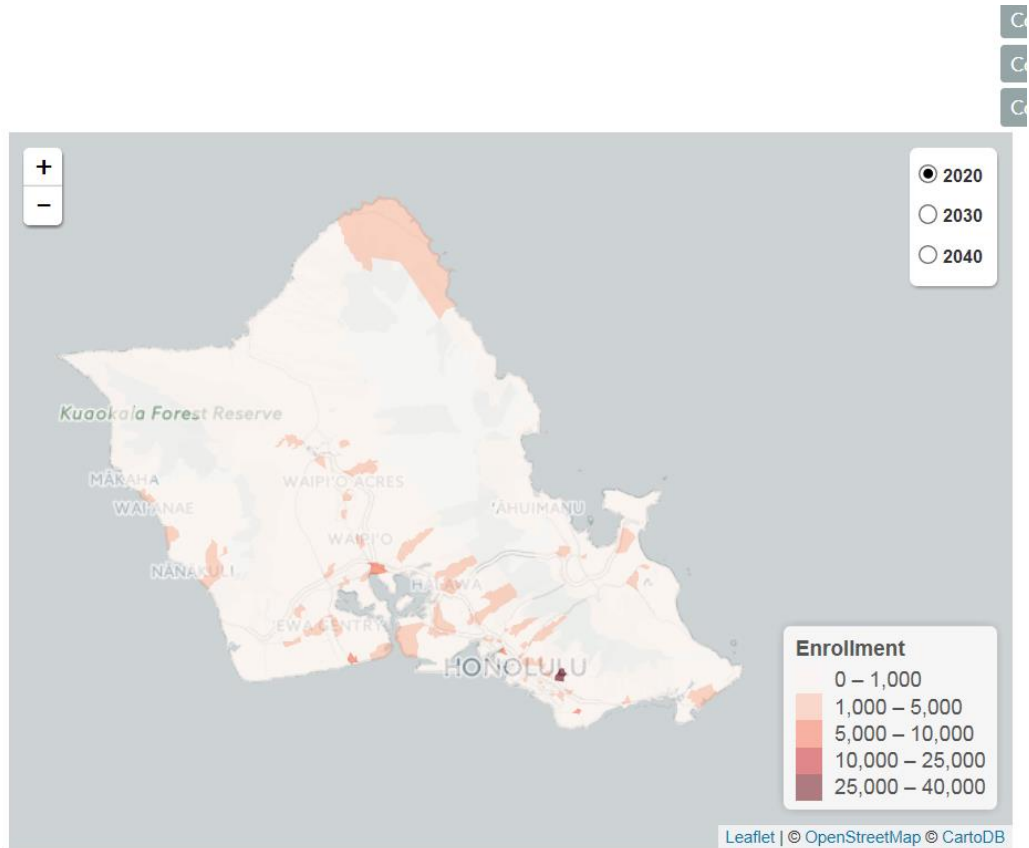
- [pbsag/tlumip](#) Oregon statewide integrated travel and land use model (Oregon Department of Transportation).
- [psrc/soundcast](#) Seattle activity-based travel demand model (Puget Sound Regional Commission).

Leaflet-based Spatial Visuals

The Systems Analysis Group provides interactive mapping embedded in model reports and documentation. As an example, the island of Oahu is mapped below with enrollment shown over the next three decades. The freedom to zoom and pan while toggling different data layers empowers our clients to review more effectively.

Interactive maps can be used to show population shifts over time, travel time changes, link congestion, and many other important metrics.

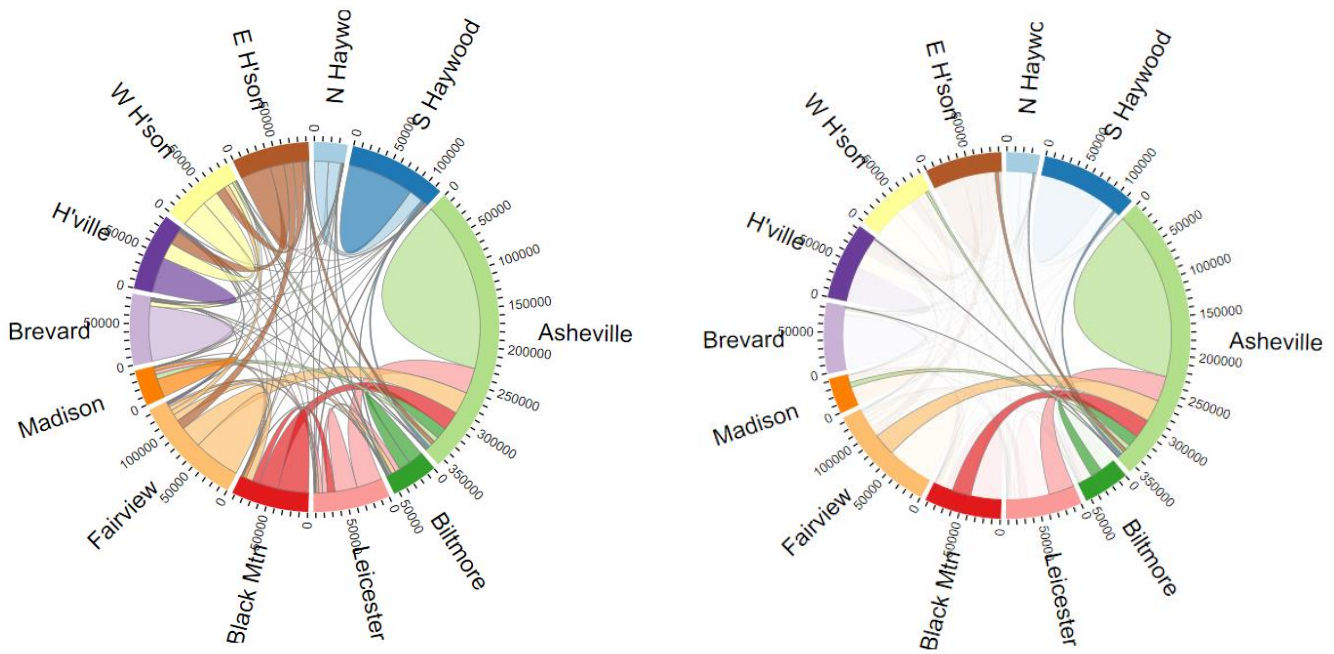
- Introduction
- HTML-based Deliverables**
- Delivery through Git and GitHub



Innovative Data Display

Origin-destination data is notoriously difficult to display. A metropolitan area really cannot be represented with fewer than about 12 districts. This this information would result in either a table of 144 values (without margins), or a desire line diagram. Either of these data delivery methods can be notoriously difficult to comprehend.

Modern graphic designers have developed “chord diagrams” for representing the volumes of flows between discrete points or states. These diagrams can be interactive through the use of embedded JavaScript programs. The flows below are those between the districts of the Asheville travel demand model.



Interactive Plot Objects

This R Markdown document is made interactive using Shiny. Unlike the more traditional workflow of creating static reports, you can now create documents that allow your readers to change the assumptions underlying your analysis and see the results immediately.

To learn more, see [Interactive Documents](#).

In the application below, a user can explore the highway assignment validation from a travel demand model.

- The box on the left allows a user to filter links that they are interested in examining. The plot, equation, and statistics tables will update themselves accordingly.
- The user can drag a window around points in the plot, and the link table will show the identifying information for these points.

Minimum Link Volume (000s):

0 10 50

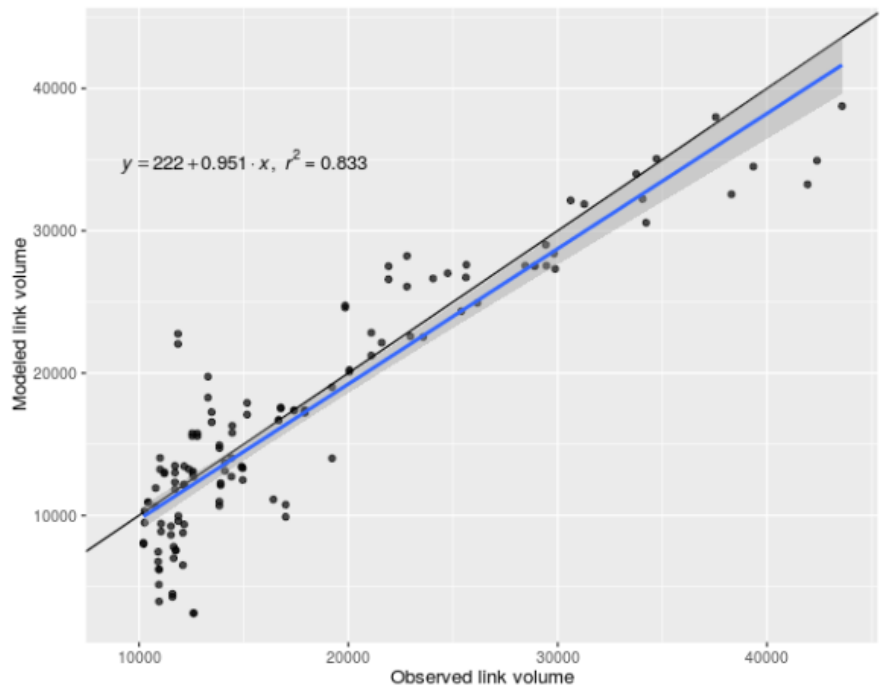
0 5 10 15 20 25 30 35 40 45 50

Area Type

All

Facility Type

All



Show 25 entries Search:

a b facility_type facility_group area_type volume

No data available in table

a b facility_type facility_group area_type volume

Showing 0 to 0 of 0 entries

Previous Next

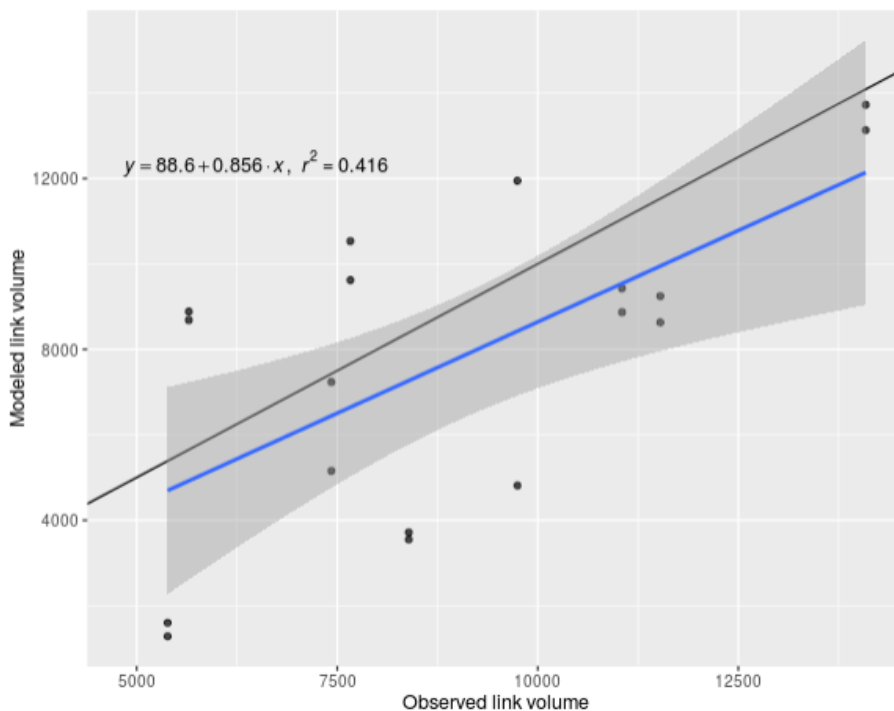
	Total Volume	Total Count	Percent RMSE
1	2194593.00	2278449.00	20.02

Minimum Link Volume (000s):

 0 5 10 15 20 25 30 35 40 45 50

Area Type

Facility Type



Show entries Search:

a **b** **facility_type** **facility_group** **area_type** **volume**

No data available in table

a **b** **facility_type** **facility_group** **area_type** **volume**

Showing 0 to 0 of 0 entries

[Previous](#) [Next](#)

	Total Volume	Total Count	Percent RMSE
1	140084.00	161864.00	34.61

From: Macfarlane, Gregory <macfarlaneg@pbworld.com>
To: Mei Ingram <mzingram@ncsu.edu>
cc: "Huntsinger, Leta" <Huntsinger@pbworld.com>, "Fussell, Rhett" <Fussell@pbworld.com>, "Ward, Kyle" <warddk@pbworld.com>
Date: Fri, May 13, 2016 at 2:56 PM
Subject: Re: NCMUG - 2016-05-11: Please send me your presentation file

Mei,

We are glad you enjoyed the presentation, and hope we can all move the profession forward together.

There are a few difficulties with sending you presentation files that you would host.

- your website won't be running the software required to make the interactive visuals work
- so much of the presentation was interactive, and there's actually very little information on many of the slides
- doing this would be an end-of-the-road deliverable, which is exactly what we are trying to move away from.

As an alternative that we hope will be acceptable, we have built a webpage at

<https://pbsag.github.io/marketing/DeliverablesReborn.html>

This webpage contains most of the basic information from the presentation, hosts the interactive graphics, and displays everything in the format that we hope people will begin to accept. And as we see new graphics or get new tools, we will add to this document.

Where you would normally include a link to the presentation files, we would encourage you to link to this document instead.

Let me know if you have questions.

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