

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP) PROJECTS R-2721, R-2828, & R-2829



Memo to File Regarding Connect 2045 Regional Forecasts Adopted by CAMPO February 21, 2018

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1. Introduction

The Complete 540 Final Environmental Impact Statement (FEIS) includes a Quantitative Indirect and Cumulative Effects (ICE) analysis. The Quantitative ICE analysis was developed by North Carolina Department of Transportation (NCDOT), the Federal Highway Administration (FHWA), and state and federal regulatory agencies. The purpose of the study was to determine what changes to land use and water quality would be anticipated in the Future Land Use Study Area (FLUSA) for the project if the project were constructed (the Build Scenario) and if it were not constructed (the No-Build Scenario). The FLUSA contains portions of Wake, Johnston, and Harnett counties.

In the course of developing the Quantitative ICE, the NCDOT team met with area planners from all area jurisdictions, as well as with the Capital Area Metropolitan Planning Organization (CAMPO) and the Triangle J Council of Governments (TJ COG), who are responsible for long-range transportation and planning efforts in the region.

At the time of the completion of the FEIS, the existing land use plan for the FLUSA was the Imagine our Future 2040 Initiative (Imagine 2040). Imagine 2040 was an initiative started in 2010 by the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) and CAMPO to promote community-based regionalism, aimed at guiding growth and coordinating decision-making processes for a more sustainable transportation system. Imagine 2040 was developed using CommunityViz software. As an extension of ESRI's ArcGIS desktop software, CommunityViz facilitates the visualization and comparison of development scenarios. The base year for Imagine 2040 is 2010, and the forecasts are for a 30-year period from 2010 to 2040.

In February 2018, the CAMPO Policy Board approved the updated 2045 Metropolitan Transportation Plan (MTP), and with it, the socioeconomic forecasts from the Connect our Future 2045 Initiative (Connect 2045). Connect 2045 was also developed using CommunityViz, but with a new version of the software and based on updated input data. The Connect 2045 planning effort also used new control-total forecasts for population and employment. These new forecasts are associated with the update of the regional travel demand model, TRM 6. The base year for Connect 2045 is 2013, and the forecasts are for a 32-year period from 2013-2045.

Complete 540 was included as part of the future roadway network in Imagine 2040. Based on input from CAMPO, the Imagine 2040 forecasts were determined to represent a Build scenario for Complete 540 and were employed as such in the Quantitative ICE, as described in Quantitative ICE Memo #1 (Michael Baker Engineering, Inc., 2017a). The Build Alternative provides an important benchmark for cumulative impact analysis. Similarly, the Connect 2045 forecasts include Complete 540 and its anticipated effects on land use as of the 2045 initiative timeline (CAMPO 2018a, p. 35; CAMPO 2018c). Therefore, given that new regional forecasts have been adopted, the Complete 540 study team has examined the new forecasts to determine if they indicate substantive changes that could markedly alter the Quantitative ICE analysis findings. This memo provides an overview of the findings and main conclusions from comparing the Imagine 2040 and Connect 2045 forecasts. Additional detail on the forecast updates and the data used to compare the forecasts are provided in Appendix A.

This memo does not re-evaluate the induced land use impacts from the ICE analysis. The overall amount of induced land use effects was determined using the Historical Research Approach, based on two data sets: 1) the interstate highway centerline mileage of the region (percentage increase from adding Complete 540), and 2) the Raleigh Metropolitan Statistical Area (MSA) 2015 employment (Michael Baker

Engineering, Inc., 2017a). Neither data set is affected by new regional socioeconomic forecasts¹. Therefore, the induced land use effects of the 2040 No Build Alternative would be the same relative to the 2040 Build in terms of the control totals derived from the Historical Research Approach even if new regional forecasts representing the 2040 Build Alternative were introduced. The sensitivity analysis in this memo focuses on a comparison of the original 2040 Build scenario (which was the basis for cumulative effects analysis) and the new regional forecasts. The Complete 540 2040 No-Build scenario forecasts are provided for reference, but this sensitivity analysis does not apply to them for the reasons stated above.

2. Summary of Connect our Future 2045 Forecasts

The Connect 2045 forecasts were prepared using an updated set of 2045 control-total forecasts of population and employment for the component regions. For CAMPO, the region was enlarged to include more of Harnett and Johnston counties, and for the first time, a portion of Nash County². The CAMPO comparisons for Johnston and Harnett counties between the 2040 and 2045 forecasts, therefore, appear different on the basis of the new forecasts and the changes in geography, as described in the document *Capital Area MPO Socio-Economic Forecasts* (CAMPO, 2018b). For the comparison of forecasts relative to Complete 540, the study team has identified consistent geographies of the FLUSA and watersheds, to ensure that comparisons in this memo highlight any differences that are strictly due to the updated forecasts.

However, there are some challenges in making these comparisons. For example, the geography of the traffic analysis zones (TAZs), which is typically the most geographically detailed output of the socioeconomic forecasts, was altered for TRM 6. Therefore, making summary comparisons for geographies within the jurisdictions, such as watersheds, requires an even more fine-scale assessment. The CommunityViz model uses a “grid cell” level of data that is consistent between the Imagine 2040 and Connect 2045 forecasts; therefore, the comparisons discussed in this memo were captured at the grid cell level and aggregated to the geographies shown, unless otherwise noted.

The CAMPO summary of the new forecasts (CAMPO, 2018b) points out some key differences in the new regional forecasts. For example, CAMPO notes that:

- Projected population growth for Wake and Johnston counties slowed from the 2040 forecasts to the 2045 forecasts. This may be a result of the timing of the forecasts’ preparation, which was shortly after the recession.
- The employment totals were based on the same methodology as the CAMPO 2040 forecasts, using current data from the North Carolina Employment Security Commission (ESC) as the basis for the estimates. Based on previous study findings that the ESC county-level employment estimates capture 92% of the actual total (see CAMPO, 2018b for references), the base year totals for Connect 2045 were adjusted to reflect this observed undercount, and then projected using growth rates from Woods and Poole Economics. Based on the updated (2013) data and

¹Note that if additional highway centerline miles were recently added to the roadway network, the percentage increase in the region’s highway centerline mileage resulting from Complete 540 would only decrease, which in turn would reduce the induced land use effects. Thus, retaining the original analysis is the conservative approach.

² The Connect our Future planning process included a Forecast Area that is larger than the metropolitan planning area. Specifically, “While not in the MPO planning boundary, a small portion of Nash county is included in the model boundary and a population forecast was completed as well.” (CAMPO, 2018b). Typically, these expansions are intended to better account for ‘external’ trip origins that enter the study region, based on updated travel patterns.

forecasts, the Wake County employment growth rate is higher than that of the 2040 forecasts.

Another important difference between the 2040 and 2045 forecasts is the time period for which growth is forecasted. Imagine 2040 forecasts growth from 2010 to 2040, while Connect 2045 forecasts growth from 2013 to 2045. In order to directly compare the two data sets, the study team interpolated the Connect 2045 forecasts (using a straight-line interpolation from 2013 to 2045, as is consistent with TJCOG and CAMPO interim year forecasts, as discussed in Appendix A). Specifically, the data sets used in the comparisons in this memo are as follows:

- Connect our Future 30-Year Growth (new) – the 30-year forecasted growth in dwelling units and employees interpolated from Connect our Future 2045.
- Imagine our Future Growth – the 30-year forecasted growth in dwelling units and employees from Imagine 2040.
- Complete 540 No-Build Growth – the 30-year forecasted growth in dwelling units and employees from the Complete 540 quantitative ICE analysis.
- 2010 CAMPO base year data – Base year dwelling units and employees for the Imagine 2040 TAZ structure.

Most of the comparisons that follow focus on the three 30-year forecast data sets. However, the 2010 base year data are used as needed to show cumulative differences in the forecasts. Importantly, the comparisons are offered as a sensitivity analysis of whether the new Connect our Future 30-Year Growth forecasts produce differences that would call into question the original Quantitative ICE findings that were based on the Imagine our Future Growth forecasts. The comparisons, therefore, focus on the new Connect our Future 30-Year Growth and the Imagine our Future Growth. The Complete 540 No-Build Growth figures are provided for context, but comparisons between the Complete 540 No-Build and Connect our Future 30-Year Growth totals do not represent new results for indirect effects.

3. Comparisons of Connect our Future and Imagine our Future 30-Year Growth Forecasts

Table 1 provides the summary comparisons of the new Connect our Future and the prior Imagine our Future 30-year growth forecasts for the FLUSA, and Table 2 provides the cumulative totals for comparison by adding the 30-year forecasts to 2010 base year data. Looking at FLUSA totals, the 30-year growth of both dwelling units and employees is lower in the new Connect our Future forecasts than it was in Imagine our Future.

The FLUSA-level comparisons of the Imagine our Future and Connect our Future 30-year growth forecasts suggest two important conclusions. First, the quantitative ICE analysis for Complete 540 is more conservative, in that it looks at higher levels of overall cumulative effects based on an assumption of higher growth than the revised forecasts. This is true for both the 2040 Build and 2040 No-Build scenarios in the Quantitative ICE analysis – both assume higher dwelling units and employees than does the new growth forecast. Second, the differences between the old and new forecasts fall well within the typical margin of error of regional forecasts. This suggests that revisiting the entire land use analysis from the Quantitative ICE reports is unnecessary.

Specifically, as noted on page 5 of Quantitative ICE Memo #1, “For county-level projections of 25 years, the typical mean algebraic percentage errors are about 30 percent. For census tracts (which are typically larger than TAZs) errors are typically 45 percent for the same period (Smith et al., 2001).” The Connect

Table 1 Summary Comparisons of Connect our Future 30-Year Growth and Imagine Our Future Growth Forecasts – Growth Only

Geography	Connect Our Future 30-Year Growth		Imagine Our Future 30-Year Growth (Complete 540 Build)		Complete 540 No Build 30-Year Growth		Difference: Connect our Future minus Imagine our Future		Difference: Connect our Future minus Complete 540 No Build	
	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees
FLUSA	127,726	81,331	144,775	89,654	137,677	83,604	-17,049	-8,323	-9,951	-2,273

Source: Communities Explained and Michael Baker Engineering, 2018

Table 2 Summary Comparisons of Connect our Future 30-Year Growth and Imagine our Future Growth Forecasts – Total Forecast Cumulative Differences

Geography	2010 Base Year Data		Connect Our Future Cumulative 30-Year Growth+ Base		Imagine Our Future Cumulative 30-Year Growth + Base		Percent Difference: Connect our Future versus Imagine our Future Cumulative	
	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees
FLUSA	103,122	77,894	230,848	159,225	247,902	167,548	-7%	-5%

Source: Communities Explained and Michael Baker Engineering, 2018

our Future 30-year Growth forecast for dwelling units is 12 percent lower than the Imagine our Future Growth forecast, and the employee growth forecast is 9 percent lower, for the FLUSA. Table 2 provides cumulative figures for the FLUSA, adding the base year 2010 data to the 30-year forecasts. In terms of total dwelling units and total employees, the new forecast is 7 percent lower and 5 percent lower, respectively.

Keeping these margins of error in mind, it is important to look within the FLUSA at the differences between the forecasts at the watershed level, as a means of understanding whether the spatial distribution of the new forecasts point to significantly different conclusions for water quality and endangered species.

4. Watershed Comparisons

The watersheds in the Complete 540 FLUSA are discussed in detail in Quantitative ICE Memo #3 (Michael Baker Engineering, Inc., 2017c). Figure 1 presents the watersheds in the Water Quality Study Area, which is slightly smaller than the FLUSA because small remnants of watersheds are not included, as shown by the white areas between the watersheds (green) and the FLUSA boundary (purple). The watersheds that are addressed in the Biological Assessment (BA) documents disclosing potential effects of the Complete 540 project on federally protected species (Three Oaks Engineering 2017 and 2018, USFWS 2018) include the following, as identified by 12-digit Hydrologic Unit Codes (HUC).

Discussed in the Endangered Dwarf Wedgemussel BA:

- White Oak (lower and upper) (030202011003)
- Piney Grove Cemetery-Swift Creek (030202011006)
- Mahler’s Creek-Swift Creek (030202011004)
- Little Creek (lower) (030202011005)
- Reed Branch – Swift Creek (030202011007)

Discussed in the Threatened (as of April 2, 2018) Yellow Lance BA:

- Same as DWM plus Lower Middle Creek (030202010903)

Discussed in the Endangered Atlantic Sturgeon BA:

- Poplar Creek – Neuse River (030202011103)

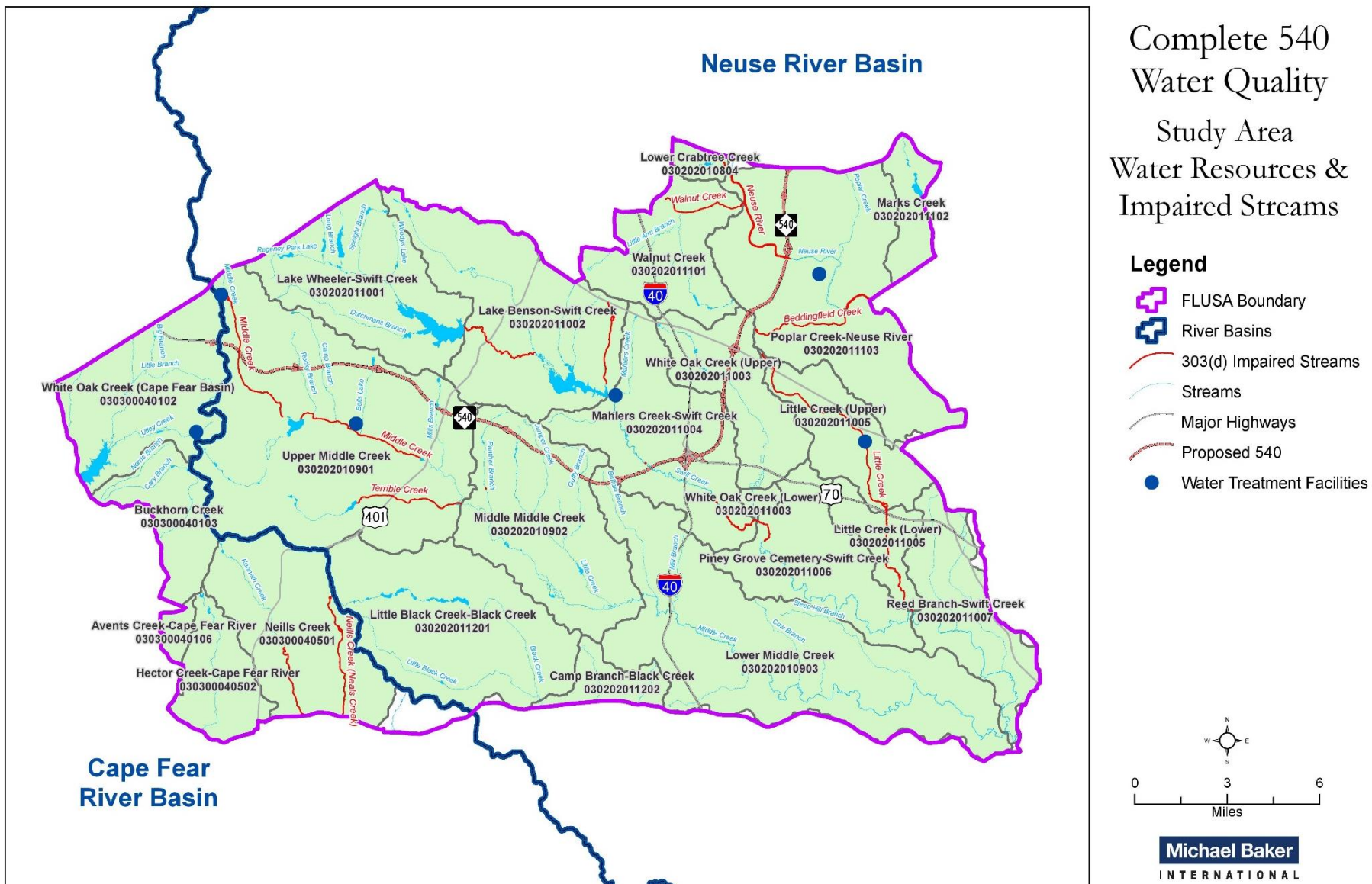
In order to compare watersheds, the grid cell data were summarized to watershed boundaries for both the Connect our Future 30-Year Growth and Imagine our Future 30-Year Growth forecasts. Table 3 provides the comparison of the two 30-year growth forecasts. The Complete 540 2040 No-Build 30-Year Growth Forecasts are also provided for comparison. As noted earlier, the differences between Connect our Future and the Complete 540 No-Build Forecasts do not represent a new interpretation of indirect effects. Figures 2 and 3 present the watershed-level comparisons of the Connect our Future 30-Year Growth and Imagine our Future 30-Year Growth forecasts for dwelling units and employees. Note, in the tables that follow, the numbers 1 through 23 listed with each watershed name are the numbers used in Complete 540 Quantitative ICE Memos #3 and #4 (Michael Baker Engineering, Inc., 2017c; 2017d) as simple identifiers for the watersheds – they have no other significance.

These data show that the FLUSA-level findings are relatively similar to those for most watersheds, with some exceptions. Looking at the eight watersheds of concern for protected species, four have higher growth in employees, one has higher growth in dwelling units, and one watershed is higher in both employees and dwelling units in the Connect our Future 30-Year Growth forecast.

A sensitivity analysis was conducted to examine whether the higher forecasts have the potential to result in notable changes in impervious surface, which would relate to conclusions in the BAs. This analysis translates the differences in dwelling units and employees between the forecasts to relative differences in land cover acreages, and in turn, relative difference in impervious acres. The acreages are compared to the total watershed acreages to gauge the potential impact on the results regarding percentage of impervious surface by watershed used in the Complete 540 Quantitative ICE analysis, which were applied in the BAs. The sensitivity analysis focuses on impervious surface in part because the water quality modeling conducted for the Quantitative ICE analysis relies heavily on the impervious surface data. Therefore, the impervious surface sensitivity analysis is a proxy for the water quality analysis as well.

Prior to conducting the sensitivity analysis, the study team checked the Connect our Future inputs to CommunityViz to determine if any changes in the Place Type designations indicated a potential for substantial differences in future densities (and associated land cover) relative to the Imagine our Future forecasts. As presented in Appendix A, less than 7 percent of the FLUSA acreage was reclassified in the update. The differences in Place Type designations between the two forecasts were primarily refinements between designations of similar density and type, such as Small Lot Residential and Shade Tree Residential, both of which are classified as Medium Density Residential for land cover, as described in Quantitative ICE Memo #2 (Michael Baker Engineering, 2017b). In the sensitive watersheds, however, a common Place Type change appears to have been from Small Lot Residential to Working Farm, which has a land cover type of Cropland. These observations about the new Connect our Future land use model inputs indicate that, at an aggregate level as applied in the sensitivity analysis that follows, the density and/or land cover types of future development appear likely to be similar to the Imagine our Future forecasts, or potentially less dense/lower in land cover. Therefore, by basing the sensitivity analysis on the 2040 land cover mix of the original Build Alternative, the analysis that follows is a reasonable and conservative approach.

Figure 1 Watersheds and Impaired Streams in the FLUSA



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Table 3 Summary Comparisons of 30-Year Growth Forecasts by Watershed*

Watersheds	Connect Our Future 30-Year Growth		Imagine Our Future 30-Year Growth (Complete 540 Build)		Complete 540 No Build 30-Year Growth		Difference: Connect our Future minus Imagine our Future		Difference: Connect our Future minus Complete 540 No Build	
	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees
White Oak Creek (Lower) - 1	205	290	247	97	246	91	-42	193	-41	199
Avents Creek-Cape Fear River - 2	132	0	151	60	141	47	-19	-60	-9	-47
Hector Creek-Cape Fear River - 3	495	1	768	99	784	118	-273	-98	-289	-117
Camp Branch-Black Creek - 4	159	0	321	47	283	44	-162	-47	-124	-44
Neills Creek - 5	13,802	2,606	12,529	5,595	12,258	5,535	1,273	-2,989	1,544	-2,929
Little Black Creek-Black Creek - 6	7,450	5,283	9,942	2,649	9,410	2,570	-2,492	2,634	-1,960	2,713
Buckhorn Creek - 7	5,436	727	6,577	1,598	6,475	1,582	-1,141	-871	-1,039	-855
Lower Middle Creek - 8	3,764	218	5,324	2,387	4,602	1,998	-1,560	-2,169	-838	-1,780
Reed Branch-Swift Creek - 9	2,393	588	2,231	1,261	2,050	1,174	162	-673	343	-586
Piney Grove Cemetery-Swift Creek - 10	1,702	3,349	2,131	1,106	1,957	934	-429	2,243	-255	2,415
Middle Middle Creek - 11	5,494	4	7,302	356	5,946	273	-1,808	-352	-452	-269
White Oak Creek (Cape Fear Basin) - 12	6,181	15,241	11,513	22,584	11,323	21,947	-5,332	-7,343	-5,142	-6,706
Little Creek (Lower) - 13	1,074	0	1,123	0	1,090	0	-49	0	-16	0
Upper Middle Creek - 14	25,828	11,054	29,519	20,493	29,536	17,845	-3,691	-9,439	-3,708	-6,791
Mahlers Creek-Swift Creek - 15	7,755	8,233	10,474	7,723	9,500	7,091	-2,719	510	-1,745	1,142

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Table 3 Summary Comparisons of 30-Year Growth Forecasts by Watershed*

Watersheds	Connect Our Future 30-Year Growth		Imagine Our Future 30-Year Growth (Complete 540 Build)		Complete 540 No Build 30-Year Growth		Difference: Connect our Future minus Imagine our Future		Difference: Connect our Future minus Complete 540 No Build	
	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees	Dwelling Units	Employees
Lake Benson-Swift Creek - 16	7,941	6,459	6,938	3,848	6,873	3,818	1,003	2,611	1,068	2,641
Lake Wheeler-Swift Creek - 17	1,750	4,008	1,860	3,698	1,821	3,631	-110	310	-71	377
Walnut Creek - 18	8,680	6,165	12,590	3,634	12,587	3,481	-3,910	2,531	-3,907	2,684
Poplar Creek-Neuse River - 19	19,845	4,515	15,045	2,884	13,047	2,693	4,800	1,631	6,798	1,822
Marks Creek - 20	1,264	83	2,036	242	2,023	229	-772	-159	-759	-146
Lower Crabtree Creek - 21	260	998	254	1,016	254	948	6	-18	6	50
White Oak Creek (Upper) - 22	4,322	9,716	4,797	7,225	4,363	6,807	-475	2,491	-41	2,909
Little Creek (Upper) - 23	3,171	3,796	2,505	3,861	2,473	3,504	666	-65	698	292
Total*	129,103	83,334	146,177	92,463	139,042	86,360	-17,074	-9,129	-9,938	-3,026

*The total is for the combined watersheds as calculated from grid cell data. In some cases, grid cells that summarize watershed areas include small areas beyond the curvilinear FLUSA boundary line. This spatial arrangement of watershed area grid cells aggregates to slightly more area than the FLUSA boundary and, thus, results in slightly higher values than FLUSA totals.

Note: The rows in blue are the watersheds referenced in the Complete 540 BAs. Yellow highlighted cells show increases in the new Connect our Future 30-Year Growth figures relative to the Imagine our Future 30-Year Growth figures within those critical watersheds.

Source: Communities Explained and Michael Baker Engineering

Figure 2 Comparison of Connect our Future and Imagine our Future 30-Year Growth Forecasts for Dwelling Units by Watershed

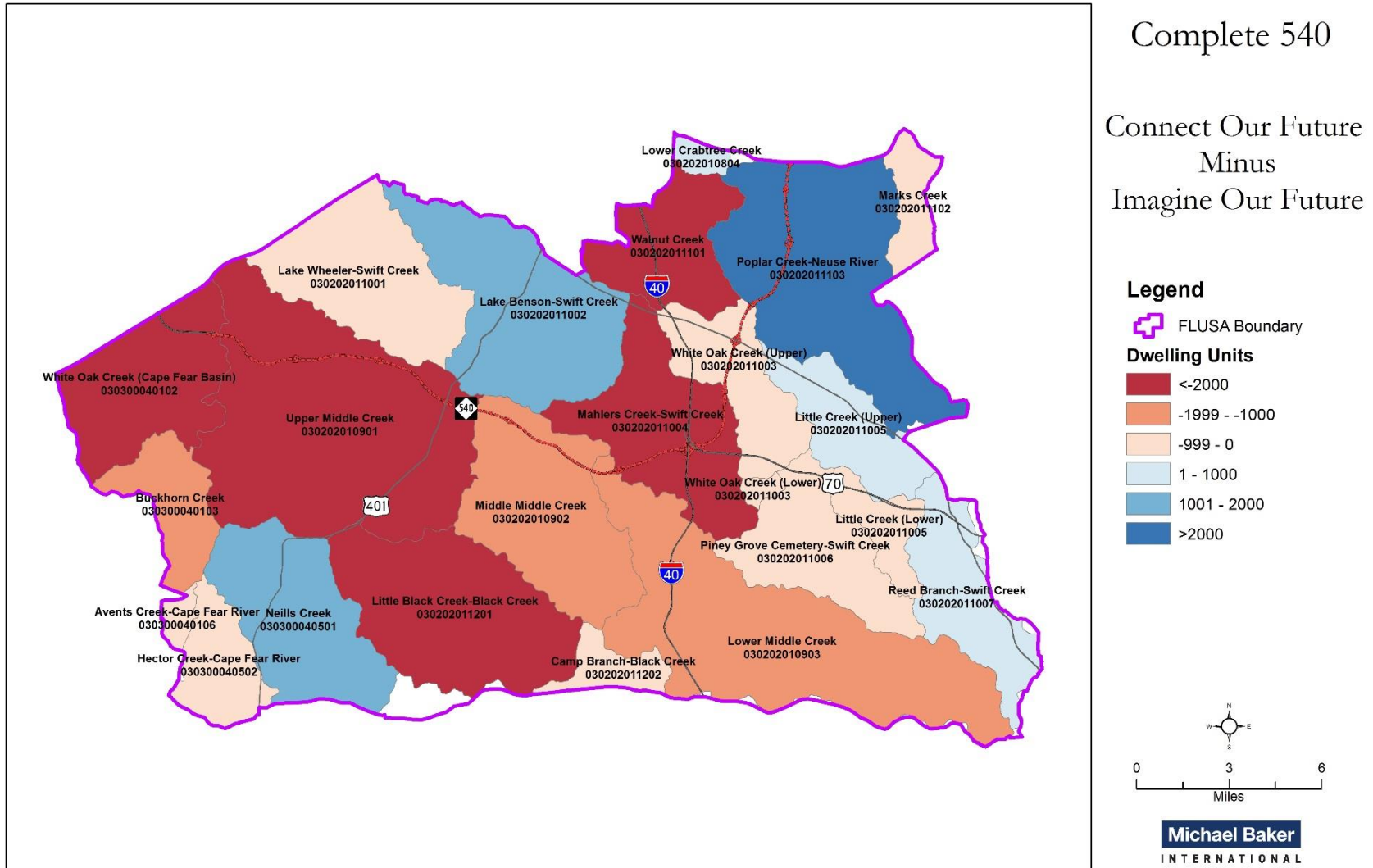
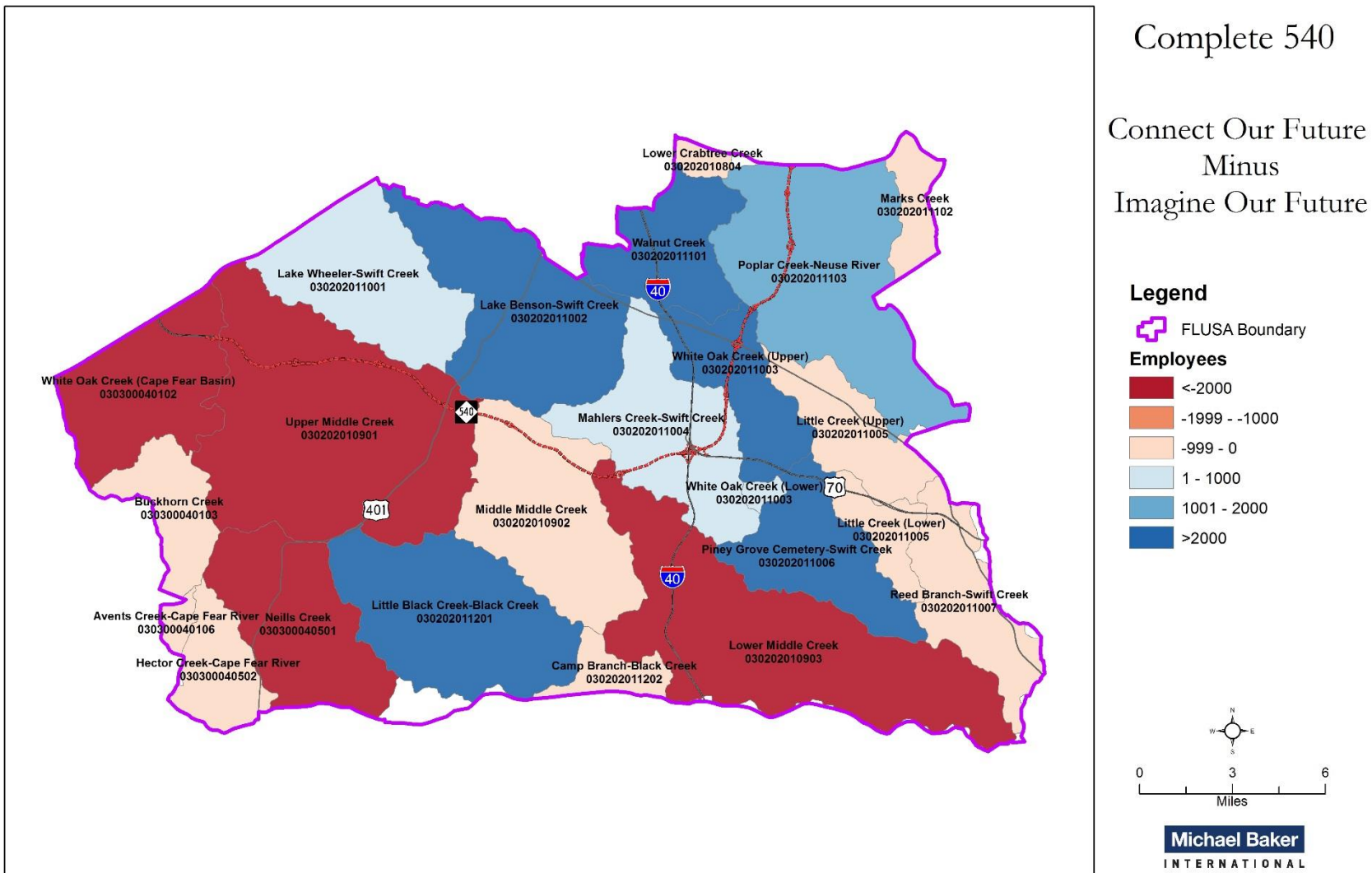


Figure 3 Comparison of Connect our Future and Imagine our Future 30-Year Growth Forecasts for Employees by Watershed



Sensitivity Analysis of Higher Growth Forecasts in Sensitive Watersheds

Several factors influence the extent to which higher growth forecasts in a particular watershed could point to higher impervious surface percentages. These include the relative increase in acres of development, the mix of development types and densities, and the impervious surface ratios associated with development types. The Quantitative ICE memos #2 and #3 describe in detail the methodology for preparing a detailed calculation of land cover from the CommunityViz land use output data and the methodology for translating land cover to percentage of impervious surface by watershed (Michael Baker Engineering, Inc., 2017b; 2017c).

The approach for this sensitivity analysis uses the Connect 2045 socioeconomic data to assign land cover types in each watershed to help assess the relative change in land cover acres as compared to the Imagine 2040 land cover. The Connect 2045 land cover data were then used to estimate the relative difference in impervious surface acres as a percentage of the total watershed acres. This approach did not duplicate all of the steps in the original analysis described in Quantitative ICE Memo 2, including the conversion of CommunityViz grid cell data to land cover and the detailed land cover data analysis for impervious surface calculations. The sensitivity analysis only serves as an exercise to determine whether there are differences in the new forecasts of sufficient magnitude to warrant further analysis of indirect and cumulative effects. These calculations are done separately for dwelling units and employment in each watershed. They build on information calculated in the Quantitative ICE analysis that is presented in Memos 2 and 3, including the land cover types from the National Land Cover Database (NLCD), the categorization of the CommunityViz Place Types into the NLCD land cover types, and the impervious surface ratios for each land cover type (Michael Baker Engineering, Inc., 2017b; 2017c).

The analysis refers to “land cover acres,” which are the acres identified in the Quantitative ICE analysis as having development in each land cover type. “Employment-related land cover acres” refers to developed acres associated with employment (such as commercial, office, industrial, or retail as represented by the land cover types), and “dwelling-related land cover acres” refers to developed acres associated with dwelling units (i.e., residential classifications and the residential component of mixed-use classifications of land cover). “Impervious surface acres” are the number of acres converted to impervious surface based on additional growth or converted from impervious surface based on less growth. The developed acres are referred to as land cover acres because they are taken from the Quantitative ICE analysis of land cover, as documented in ICE Memo #2 (Michael Baker Engineering, Inc., 2017b). Note that the methodology for this calculation assumes that parcels with more than 75% build-out are measured as fully built out, thereby slightly overestimating developed land cover. This makes the analysis more conservative, in that it errs on the side of over-estimating impacts.

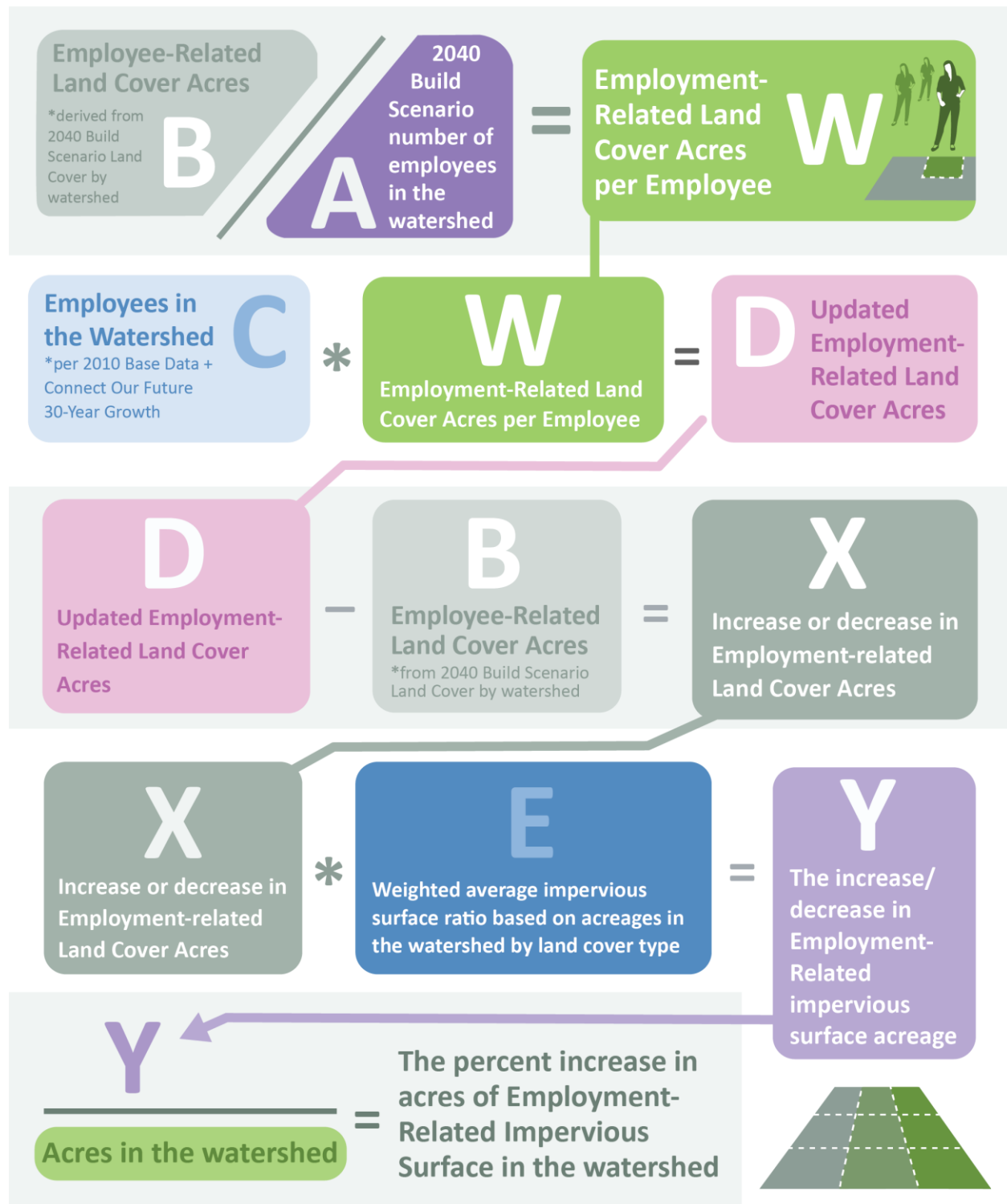
The steps in the sensitivity analysis process are as follows:

1. Using the 2040 Build scenario (Imagine 2040) data, comprised of the Imagine our Future Growth forecasts, calculate the acres of each type of land cover that is related to development (i.e., medium density mixed use, low density residential, etc.).
2. Differentiate acreages associated with employment from acres associated with dwelling units (as explained further below).
3. For acres associated with employment, calculate the original land cover acres per employee based on the mix of densities in the 2040 Build scenario in each watershed. This ratio will vary by watershed.
4. Multiply the ratio calculated in step 3 by the new total employees from the Connect our

- Future 30-Year Growth forecast (cumulative total) to provide the new land cover acres associated with employment growth in each watershed.
5. Using the 2040 Build scenario data, calculate the weighted average impervious surface ratio for the employment-related land cover types by watershed. This ratio will vary by watershed.
 6. Multiply the ratio calculated in step 5 by the new number of acres associated with employment growth to calculate the estimated number of impervious surface acres by watershed.
 7. Divide the estimated number of new impervious surface acres by watershed by the total acres in the watershed to estimate the change in impervious surface percentage by watershed.
 8. Repeat steps 3 through 7 for dwelling units, land coverage acres associated with dwellings, impervious surface ratios associated with dwellings, and estimated change in impervious surface associated with dwellings.
 9. Combine the employment-related and dwelling-related changes in impervious surface percentages for a net change in impervious surface percentage for each watershed.

The steps in the sensitivity analysis are shown in the diagram in Figure 4, followed by an explanation of key assumptions. Figure 4 shows the process for deriving the employment-related change in predicted impervious surface areas (steps 1-7 above) and the same steps were repeated for dwelling units as noted in step 8 above. The calculations and results by watershed are provided in Tables 4 through 9 that follow the explanatory text. Note that, when it comes to impacts on land cover, dwelling units tend to have a greater impact than employees, as evidenced in the ratios that are calculated in step 3, or “W” in the figures and tables that follow.

Figure 4 Diagram of Sensitivity Analysis Calculations for Employment-Related Development in a Watershed



Each step of the sensitivity analysis uses data from the Quantitative ICE analysis. The analysis included several explicit and implicit assumptions, as follows:

- The premise of the overall sensitivity analysis is that 2040 cumulative growth under Connect our Future 30-Year Growth would have the same average densities as the Imagine our Future Growth. This is an implicit assumption, because the Imagine our Future Growth densities from the Quantitative ICE Build scenario are used as the basis for calculating several weighted averages such as acres per employee, acres per dwelling unit, and the weighted average impervious surface ratios. This is a conservative assumption (erring on the side of overestimating impacts). For example, the calculated land cover acres per employee and land cover acres per dwelling unit (B/A in Tables 5 and 6) are on the high end compared to objective calculations of density, resulting in slightly higher development and impervious surface estimates. Specifically, most of the dwelling unit averages are close to 1 acre per unit, which is high for an average that includes some medium- and/or high-density development. The employment averages also are at the high range of calculations based strictly on employee space utilization and floor-to-area ratios from CommunityViz.³ One reason for the higher ratios in the sensitivity analysis may be the rounding up of land cover acres in parcels with 75% or more build-out, as referenced earlier in this section and in Quantitative ICE Memo #2 (Michael Baker Engineering, Inc., 2017b).
- In order to account for the employment-related and dwelling unit-related components of mixed use development separately, an explicit assumption was made to divide these acreages. Specifically, the sensitivity analysis methodology relies on identifying all the employment-related land cover acres and all the dwelling-related land cover acres. Several land cover categories are mixed-use development, which generally include both employment and dwellings.
 - To understand the range of land uses in each mixed-use land cover category, the study team referred to Table 1 in Quantitative ICE Memo #2. This review showed that Low-Density Mixed Use land cover has no residential Place Types; therefore, this land cover category was classified as employment-related only.
 - Medium- and High-Density Mixed-Use land cover types include both employment and dwelling-unit Place Types. To divide these acres, the study team considered space ratios from Community Viz. For commercial development, space ratios are either 2.86 or 3.25 employees per 1,000 square feet (Michael Baker Engineering, Inc., 2017d). One can assume 1,000 square feet of space would account for roughly 1 dwelling unit or about 3 employees. Thus, the study team divided the medium- and high-density land cover acres into 25 percent employment-related and 75 percent dwelling-related, to account for the

³ As a validation check, the acres per employee ratios were calculated for a range of development types and densities using the employee space allocation and floor-to-area ratios from CommunityViz, as provided in the Quantitative ICE Memo #4 CommunityViz appendix (Michael Baker, 2017d). The range was 0.03 to 0.25, whereas the range of acres per employee calculated within the sensitivity analysis is 0.08 to 0.26. The sensitivity analysis range makes sense given that all the watersheds have mixed densities (which elevate the ratio).

larger footprint of each dwelling unit.⁴

- To convert the calculation of the updated acreage of employment- and dwelling-related land cover, a watershed-specific impervious surface ratio is needed for employment-related land covers and dwelling-related land covers. The sensitivity analysis uses a watershed-specific weighted average, calculated from the acreage by land cover category and the impervious surface ratios by land cover category as described in Quantitative ICE Memo #3 (included as Attachment A to this memo). The Quantitative ICE analysis used two methods for estimating impervious surface, resulting in an upper-limit estimate and a lower-limit estimate. The Quantitative ICE analysis and the BA documents report both the upper- and lower-limit estimates for impervious surface and report the water quality results associated with each. Therefore, Tables 4 and 5 present the results using the upper-limit impervious surface estimates and Tables 6 and 7 provide the results from the sensitivity analysis where the lower-limit land cover category impervious surface ratios are applied. Because the differences in the impervious surface ratios of some land cover types vary widely between the upper- and lower-limit estimation methods and because of the unique land cover mix of each watershed, the differences in the upper- and lower-limit ratios affect the net differences between the two sets of sensitivity analysis results.⁵

Table 9 provides a summary of results including the net difference in impervious surface from the sensitivity analysis and the forecasted 2040 Build Scenario impervious surface for both upper- and lower-limit estimates from the Quantitative ICE analysis. The results by watershed are discussed in Section 5 of this memo.

⁴ This assumption assumes a roughly even split of employees and dwelling units in a mixed-use land cover type. For validation, the study team also ran the sensitivity analysis assuming 75% employment-related and 25% dwelling-related division of medium- and high-density mixed-use land cover, which would represent mixed-use development with more commercial than residential space allocation. The results produced even higher acres per employee ratios relative to the validation of those statistics based on CommunityViz parameters, suggesting that the applied approach of 25% employment and 75% residential is more internally consistent.

⁵ For example, the differences have the most impact on higher density land cover types, which make up a larger share of employee-related land cover (i.e., proportionally more low-density land cover is dwelling-related land cover). Therefore, the watersheds with decreased residential acreage and increased employment acreage in the Connect our Future forecast tend to have a small negative net difference with the upper-limit estimation and a small positive net difference with the lower-limit estimation. These differences are of little or no consequence to the final conclusions.

Table 4 Summary Comparisons of Cumulative Growth Forecasts by Sensitive Watersheds with Any Higher Growth under Connect our Future 30-Year Growth Forecast

Developed Land Cover Code - Type	White Oak Creek (Lower) - 1		Reed Branch-Swift Creek - 9		Piney Grove Cemetery-Swift Creek - 10		Mahlers Creek-Swift Creek - 15		Poplar Creek-Neuse River - 19		White Oak Creek (Upper) - 22	
	Acres	Percent of Watershed	Acres	Percent of Watershed	Acres	Percent of Watershed	Acres	Percent of Watershed	Acres	Percent of Watershed	Acres	Percent of Watershed
2-Low Density Mixed Urban – (Emp-Related)	13	2.07%	382	3.95%	297	2.74%	610	4.11%	963	3.91%	926	10.72%
3-High Density Mixed Urban – (Emp-Related)	6	0.89%	159	1.65%	4	0.04%	125	0.84%	67	0.27%	267	3.10%
3-High Density Mixed Urban – (Dw-Related)	17	2.68%	477	4.94%	12	0.11%	374	2.51%	202	0.82%	802	9.29%
17-Low Density Residential	174	27.51%	1,194	12.37%	2,974	27.39%	2,921	19.65%	3,119	12.65%	1,045	12.11%
18-Medium Density Residential	228	36.14%	2,342	24.27%	1,541	14.19%	6,629	44.60%	11,816	47.92%	3,792	43.92%
19-High Density Residential	5	0.74%	2	0.02%	15	0.14%	87	0.58%	65	0.26%	71	0.82%
20-Medium Density Mixed Urban (Emp-Related)	3	0.54%	13	0.14%	6	0.06%	199	1.34%	73	0.29%	83	0.97%
20-Medium Density Mixed Urban (Dw-Related)	10	1.61%	40	0.41%	19	0.18%	597	4.02%	218	0.88%	250	2.90%
TOTAL	632	72%	9,651	48%	10,858	45%	14,862	78%	24,659	67%	8,634	84%

Emp-Related: Employment-Related; Dw-Related: Dwelling-Related. Category 2, Low Density Mixed Urban, does not include any residential place types (see Quantitative ICE Memo #2, Table 1), and therefore does not have dwelling-related acreage.

DRAFT Connect 2045 Regional Forecasts Memo to File

Table 5 Sensitivity Analysis Calculations for Employment-Related Land Cover Acres with Upper-Limit Impervious Surface Ratios

Data/Calculation		White Oak Creek (Lower) - 1	Reed Branch- Swift Creek - 9	Piney Grove Cemetery-Swift Creek - 10	Mahlers Creek-Swift Creek - 15	Poplar Creek- Neuse River - 19	White Oak Creek (Upper) - 22
A	2040 Build Scenario Employees (Imagine 2040)	143	2,165	1,698	11,563	4,875	10,073
B	Employment-Related Land Cover Acres	22	554	308	934	1,103	1,277
W	Emp-Related Land Cover Acres/Employee	0.16	0.26	0.18	0.08	0.23	0.13
C	Updated Employees (Connect our Future)	336	1,492	3,941	12,073	6,506	12,564
D=C*(W)	Updated Emp-Related Land Cover Acres	52	382	714	975	1,472	1,592
X=D-B	Change in Emp-Related Land Cover Acres	30	-172	406	41	369	316
E	Weighted Avg Impervious Surface Ratio (Emp-Related Land Cover Only)	0.391	0.365	0.167	0.325	0.218	0.325
Y=X*E	Change in Impervious Surface Acreage	12	-63	68	13	81	103
Y/Acres	Percent Change in Impervious Surface Acreage from Emp-Related Land Cover	1.9%	-0.7%	0.6%	0.1%	0.3%	1.2%

Table 6 Sensitivity Analysis Calculations for Dwelling-Related Land Cover Acres with Upper-Limit Impervious Surface Ratios

Data/Calculation		White Oak Creek (Lower) - 1	Reed Branch- Swift Creek - 9	Piney Grove Cemetery-Swift Creek - 10	Mahlers Creek-Swift Creek - 15	Poplar Creek- Neuse River - 19	White Oak Creek (Upper) - 22
A	2040 Build Scenario Dwelling Units (Imagine 2040)	451	3,815	4,995	14,649	22,058	7,270
B	Dwelling-Related Land Cover Acres	434	4,054	4,562	10,607	15,419	5,960
W	Dw-Related Land Cover Acres/Dwelling	0.963	1.063	0.913	0.724	0.699	0.820
C	Updated Dw Units (Connect our Future)	409	3,977	4,566	11,930	26,858	6,795
D=C*(W)	Updated Dw-Related Land Cover Acres	394	4,226	4,170	8,637	18,775	5,571
X=D-B	Change in Dw-Related Land Cover Acres	-40	172	-392	-1,969	3,355	-389
E	Weighted Avg Impervious Surface Ratio (Dwelling-Related Land Cover Only)	0.389	0.452	0.281	0.433	0.451	0.506
Y=X*E	Change in Impervious Surface Acreage	-16	78	-110	-853	1,514	-197
Y/Acres	Percent Change in Impervious Surface Acreage from Dw-Related Land Cover	-2.49%	0.81%	-1.01%	-5.74%	6.14%	-2.282%

Table 7 Sensitivity Analysis Calculations for Employment-Related Land Cover Acres with Lower-Limit Impervious Surface Ratios

Data/Calculation		White Oak Creek (Lower) - 1	Reed Branch-Swift Creek - 9	Piney Grove Cemetery-Swift Creek - 10	Mahlers Creek-Swift Creek - 15	Poplar Creek-Neuse River - 19	White Oak Creek (Upper) - 22
A	2040 Build Scenario Employees (Imagine 2040)	143	2,165	1,698	11,563	4,875	10,073
B	Employment-Related Land Cover Acres	22	554	308	934	1,103	1,277
W	Emp-Related Land Cover Acres/Employee	0.16	0.26	0.18	0.08	0.23	0.13
C	Updated Employees (Connect our Future)	336	1,492	3,941	12,073	6,506	12,564
D=C*(W)	Updated Emp-Related Land Cover Acres	52	382	714	975	1,472	1,592
X=D-B	Change in Emp-Related Land Cover Acres	30	-172	406	41	369	316
E	Weighted Avg Impervious Surface Ratio (Emp-Related Land Cover Only)	0.219	0.213	0.183	0.210	0.191	0.208
Y=X*E	Change in Impervious Surface Acreage	7	-37	74	9	71	66
Y/Acres	Percent Change in Impervious Surface Acreage from Emp-Related Land Cover	1.0%	-0.4%	0.68%	0.06%	0.3%	0.8%

Table 8 Sensitivity Analysis Calculations for Dwelling-Related Land Cover Acres with Lower-Limit Impervious Surface Ratios

Data/Calculation		White Oak Creek (Lower) - 1	Reed Branch-Swift Creek - 9	Piney Grove Cemetery-Swift Creek - 10	Mahlers Creek-Swift Creek - 15	Poplar Creek-Neuse River - 19	White Oak Creek (Upper) - 22
A	2040 Build Scenario Dwelling Units (Imagine 2040)	451	3,815	4,995	14,649	22,058	7,270
B	Dwelling-Related Land Cover Acres	434	4,054	4,562	10,607	15,419	5,960
W	Dw-Related Land Cover Acres/Dwelling	0.963	1.063	0.913	0.724	0.699	0.820
C	Updated Dw Units (Connect our Future)	409	3,977	4,566	11,930	26,858	6,795
D=C*(W)	Updated Dw-Related Land Cover Acres	394	4,226	4,170	8,638	18,775	5,571
X=D-B	Change in Dw-Related Land Cover Acres	-40	172	-392	-1,969	3,355	-389
E	Weighted Avg Impervious Surface Ratio (Dwelling-Related Land Cover Only)	0.120	0.133	0.102	0.127	0.119	0.146
Y=X*E	Change in Impervious Surface Acreage	-5	23	-40	-250	399	-57
Y/Acres	Percent Change in Impervious Surface Acreage from Dw-Related Land Cover	-0.77%	0.24%	-0.37%	-1.68%	1.62%	-0.66%

Table 9 Summary of Net Change in Impervious Surface Ratios for Upper- and Lower-Limit Assumptions

Result	White Oak Creek (Lower) - 1	Reed Branch-Swift Creek - 9	Piney Grove Cemetery-Swift Creek - 10	Mahlers Creek-Swift Creek - 15	Poplar Creek-Neuse River - 19	White Oak Creek (Upper) - 22
Upper-Limit Estimate 2040 Build Impervious Surface Ratio from Quantitative ICE ¹	29%	22%	13%	34%	30%	40%
Net Difference in Impervious Surface Ratio from Sensitivity Analysis – Upper-Limit Results	-0.64%	+0.16%	-0.39%	-5.65%	+6.47%	-1.10%
Lower-Limit Estimate 2040 Build Impervious Surface Ratio from Quantitative ICE ²	9%	7%	5%	11%	9%	14%
Net Difference in Impervious Surface Ratio from Sensitivity Analysis – Lower-Limit Results	+0.27%	-0.14%	+0.32%	-1.62%	+1.90%	+0.12%

¹ Quantitative ICE Memo #2, Table 8 (Michael Baker Engineering, 2017b)

² Quantitative ICE Memo #2, Table 9 (Michael Baker Engineering, 2017b)

5. Summary and Conclusions

The paragraphs that follow summarize the watershed-level results of the sensitivity analysis for those watersheds referenced in protected species BAs where the new forecasts included higher 30-year growth forecasts of either dwelling units or employees (or both). Two additional watersheds featured in the BAs showed no increase in the 30-year growth forecasts under Connect our Future.

White Oak Creek (Lower) Watershed: This small watershed of just over 600 acres was broken out from the larger White Oak Creek watershed for the Quantitative ICE analysis. This watershed has a higher forecast of growth in employees in the new forecasts, but a slightly lower forecast of growth in dwelling units. Development density is relatively high, with most land cover acres in the medium-density range. Because of the relatively small changes in acres of development from the new forecasts and the offset of dwelling-unit reductions against the increase in employees, the sensitivity analysis shows marginal differences from the new forecasts. The upper-limit estimate shows a reduction of 0.64 percent impervious surface in the watershed, while the lower-limit estimate shows an increase of 0.27 percent impervious surface.

Reed Branch Swift Creek: This large watershed is at the southeastern edge of the FLUSA. The new forecasts include more dwelling units but fewer employees than the original 2040 Build forecasts. The watershed is relatively less developed than other watersheds and is forecasted to have a mix of future land use densities. Because of the relatively small changes in acres of development from the new forecasts and the offset of employee reductions against the increase in dwelling units, the sensitivity analysis shows marginal differences from the new forecasts. The upper-limit estimate shows an increase of 0.16 percent impervious surface in the watershed, while the lower-limit estimate shows a decrease of 0.14 percent impervious surface.

Poplar Branch Cemetery-Swift Creek: This large watershed includes some growth “hotspots” around the Clayton Bypass (US 70) interchange with NC 42 at the far northern end, but in total has a low level of forecasted development and also relatively low densities of development. The new forecasts indicate lower dwelling unit growth and higher employee growth. These changes again offset each other, with a net result of marginal differences indicated from the new forecasts. The upper-limit estimate shows a reduction of 0.39 percent impervious surface in the watershed, while the lower-limit estimate shows an increase of 0.32 percent impervious surface.

Mahler’s Creek-Swift Creek: This is forecast to be one of the more developed watersheds under the 2040 Build scenario, with 11 to 34 percent impervious surface in 2040 based on the lower- and upper-limit estimates, respectively. Development densities are varied. The new forecasts indicate a higher growth forecast for employees, but a higher magnitude reduction in dwelling units. As a result, the sensitivity analysis shows net negative difference for both the upper- and lower-limit estimates. The upper-limit estimate shows a difference of -5.65 percent impervious surface in the watershed, while the lower-limit estimate shows a difference of -1.62 percent impervious surface.

Poplar Creek – Neuse River: This is an especially large watershed on the east end of the FLUSA, including areas of the regional center that have higher densities of land cover. The range of estimated impervious surface under the 2040 Build scenario is 30 percent for the upper limit and 9 percent for the lower-limit estimate. The new forecasts indicate higher growth for both dwelling units and employees. Consequently, this watershed has the greatest net differences in the sensitivity analysis. The upper-limit estimate of impervious surface increases by 6.47 percent, and the lower-limit estimate is 1.9 percent higher. It is important to keep in mind that, although the total percent impervious

surface increases by 21.5 percent for the new upper-limit estimate, the biggest driver of the change in land cover and impervious surface is the additional 4,800 dwelling units in the new growth forecast, which is a 32 percent increase over the Imagine our Future 30-year growth forecast. The level of these increases falls within the margin of error for long-range regional forecasts, which is 30 percent for counties and higher for sub-county areas like this watershed (i.e., 45 percent margin of error for census tracts). This is also an area where over 1,000 acres (5% of the watershed) was reclassified to the Place Type Working Farm under Connect our Future, which would tend to have a mitigating impact on the result of a detailed recalculation of impervious cover for this watershed (See Appendix A, Watershed 19).

White Oak Creek (Upper): This watershed is in the central portion of the FLUSA and extends north into the regional center. Consequently, this watershed has relatively higher densities of development. It also has the highest projected 2040 Build scenario impervious surface ratios among the watersheds examined in the sensitivity analysis – 40 percent upper-limit estimate and 14 percent lower-limit estimate. The new forecasts include a higher employee growth forecast and a lower dwelling unit forecast. As in other watersheds with offsetting changes in the new forecasts, the sensitivity analysis shows marginal differences in the estimated net change in impervious surface. The upper-limit estimate shows a reduction of 1.1 percent impervious surface in the watershed, while the lower-limit estimate shows an increase of 0.12 percent impervious surface.

Conclusions

For the FLUSA overall, the new Connect our Future 30-year Growth forecast is lower than the Imagine our Future 30-year Growth forecast, indicating that the Quantitative ICE analysis presented a worst-case scenario for cumulative environmental effects. The Quantitative ICE No-Build 30-year Growth forecast is also higher than the new forecast. The differences between the forecasts are well within the margin of error for long-range regional forecasts at the jurisdictional level (even more so for a subdivision of jurisdictions such as the FLUSA).

A sensitivity analysis was conducted on watershed-level data from the new forecast to determine if any localized increases in dwelling unit or employee forecasts would have notable impacts on the Quantitative ICE impervious surface analysis for any watersheds associated with protected species. The sensitivity analysis is an estimate based on data and assumptions detailed in this memo and is presented as an indication of the potential impact of the new regional forecasts. Six watersheds were examined in the sensitivity analysis on the basis of higher projected dwelling units, higher projected employment, or both. This analysis indicated that reductions and/or marginal net differences in impervious surface result from the new forecasts in all watersheds analyzed, with the possible exception of Poplar Creek-Neuse River. This watershed has an estimated upper-limit net increase in impervious surface of 6 percent and a lower-limit estimated net increase of 2 percent under the new forecasts. Although the driver of the change is an increase in the dwelling unit forecast, the difference still falls within the margin of error for a sub-county long-range socioeconomic forecast.

In summary, the examination of the Connect our Future regional forecasts found that the findings of the original quantitative ICE analysis are conservative (erring on the side of high environmental impacts) overall and in most watersheds of the FLUSA. In the six watersheds that are associated with protected species and have higher forecasts of dwelling units or employment under Connect our Future, the findings of sensitivity analysis indicate that the conclusions of the original quantitative ICE analysis are robust and do not require further analysis.

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Attachment A – Impervious Surface Ratios from Table 7, ICE Memo #3

Land Use Code	Land Cover Category	Percent Impervious	
		Model Run 1 GWLF-E Defaults Upper Limit	Model Run 2 Observed Baseline Lower limit
2	Low Density Mixed Urban	15	18
3	High Density Mixed Urban	87	29
17	Low Density Residential	15	9
18	Medium Density Residential	52	12
19	High Density Residential	87	33
20	Medium Density Mixed Urban	52	25

GWLF-E: Generalized Watershed Loading Function – Enhanced (Water Quality Model)

APPENDIX A

Community Explained Memo to File

**Memorandum to File Regarding Connect 2045
Regional Forecasts Adopted by CAMPO on
February 21, 2018**

(Comparison to Original Complete 540 ICE Land Use Analysis)

For

Complete 540 – Triangle Expressway Southeast Extension

Wake and Johnston Counties, North Carolina

STIP Nos. R-2721, R-2828 & R-2829

Prepared for:



Prepared by:



1. Introduction

The Complete 540 Final Environmental Impact Statement (FEIS) includes a Quantitative Indirect and Cumulative Effects (ICE) analysis. The Quantitative ICE analysis was developed by North Carolina Department of Transportation (NCDOT), the Federal Highway Administration (FHWA), and state and federal regulatory agencies. The purpose of the study was to determine what changes to land use and water quality would be anticipated in the Future Land Use Study Area (FLUSA) for the project if the project were constructed (the Build Scenario) and if it were not constructed (the No-Build Scenario). The FLUSA contains portions of Wake, Johnston, and Harnett counties.

In the course of developing the Quantitative ICE, the NCDOT team met with area planners from all area jurisdictions, as well as with the Capital Area Metropolitan Planning Organization (CAMPO) and the Triangle J Council of Governments (TJ COG), who are responsible for long-range transportation and planning efforts in the region.

At the time of the completion of the FEIS, the existing land use plan for the FLUSA was the Imagine our Future 2040 Initiative (Imagine 2040). Imagine 2040 was an initiative started in 2010 by the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) and CAMPO to promote community-based regionalism, aimed at guiding growth and coordinating decision-making processes for a more sustainable transportation system. Imagine 2040 was developed using CommunityViz software. As an extension of ESRI's ArcGIS desktop software, CommunityViz facilitates the visualization and comparison of development scenarios. The base year for Imagine 2040 is 2010, and the forecasts are for a 30-year period from 2010 to 2040.

In February 2018, the CAMPO Policy Board approved the updated 2045 Metropolitan Transportation Plan (MTP), and with it, the socioeconomic forecasts from the Connect our Future 2045 Initiative (Connect 2045). Connect 2045 was also developed using CommunityViz, but with a new version of the software and based on updated input data. The Connect 2045 planning effort also used new control-total forecasts for population and employment. These new forecasts are associated with the update of the regional travel demand model, TRM 6. The base year for Connect 2045 is 2013, and the forecasts are for a 32-year period from 2013-2045.

Complete 540 was included as part of the future roadway network in Imagine 2040. Based on input from CAMPO, the Imagine 2040 forecasts were determined to represent a Build scenario for Complete 540 and were employed as such in the Quantitative ICE, as described in Quantitative ICE Memo #1 (Michael Baker Engineering, Inc., 2017a). The Build Alternative provides an important benchmark for cumulative impact analysis. Similarly, the Connect 2045 forecasts include Complete 540 and its anticipated effects on land use as of the 2045 initiative timeline (CAMPO 2018a, p. 35; CAMPO 2018c). Therefore, given that new regional forecasts have been adopted, the Complete 540 study team has examined the new forecasts to determine if they indicate substantive changes that could markedly alter the Quantitative ICE analysis findings.

The purpose of this memorandum is to twofold: 1) to summarize input data assumed for the FLUSA study area in the Connect 2045, Imagine 2040, and Complete 540 No Build scenario planning initiatives,

and 2) to summarize growth allocation data generated for the FLUSA study area in the same three scenario planning initiatives. Summary tables and GIS data developed by City Explained, Inc. were shared with Michael Baker Engineering and HNTB in March and April 2018 for their work on sensitivity analyses.

2. Scenario Initiative Data Descriptions

Data sets for three different scenario planning initiatives were studied for this memorandum, including:

Imagine 2040

The *Community Plans Growth Scenario* developed for Imagine 2040 included completion of the Triangle Expressway Southeast Extension between Apex and Knightdale, as well as preferred future year land use assumptions near the proposed facility collected from adopted local government plans and ordinances (reported in 2012). This scenario represented the “Build” scenario for the Complete 540 Quantitative ICE.

Future growth allocated for Imagine 2040 represented a thirty-year period — 2010 to 2040. Interim horizon periods were not considered in the CommunityViz model, and this data, when needed, was developed by the model development team for the Triangle Regional Model, v. 5 assuming equal increment growth for each year in the planning horizon (i.e., total growth anticipated for the thirty-year horizon, divided by thirty years, and multiplied by the number of years for an interim horizon period of interest).

Parcel-level data (input files) was collected for six of the sixteen sub-region models that are part of the Imagine 2040 CommunityViz Model. It was downloaded from the TJ COG website in March 2018. Grid-level data (growth allocation files) was collected from the region-wide model that is part of the Triangle Region CommunityViz Model, v. 1.0. It was also downloaded from the TJ COG website in March 2018.

Complete 540 No Build Scenario

The Triangle Region CommunityViz Model developed for Imagine 2040 was modified to study a “No-Build” scenario for Complete 540. The workflow for removing the facility in CommunityViz — impacting the build out potential, land suitability analysis, control totals, and growth allocation modules — was described in the Quantitative ICE Memo No. 4.

Future growth allocated for the Complete 540 No Build scenario represented a thirty-year period — 2010 to 2040. Interim horizon periods were not considered in the CommunityViz model, and this data, when needed, was developed by the NCTA team assuming equal increment growth for each year in the planning horizon (i.e., total growth anticipated for the thirty-year horizon, divided by thirty years, and multiplied by the number of years for an interim horizon period of interest).

Parcel-level data (input files) was collected for six of the sixteen sub-region models that are part of the Complete 540 No Build CommunityViz Model – No Build Option 2 (Duranton & Turner Methodology).

Appendix A: Memorandum to File Regarding Connect 2045 Regional Forecasts Adopted by CAMPO on February 21, 2018, Comparison to Original Complete 540 ICE Land Use Analysis May 2018

Files in the model were accessed in March 2018. Grid-level data (growth allocation files) was collected from the region-wide model that is part of the Complete 540 No Build CommunityViz Model – No Build Option 2. Files in the model were also copied from the model in March 2018.

Connect 2045

The Connect 2045 scenario planning initiative was led by the Triangle J Council of Governments in 2017/18. Generally speaking, it started with the logic, tools, and procedures developed for Imagine 2040, and focused changes on the methodology and model architecture for the land suitability (reducing the number of factors considered in the region-wide model) and growth allocation (using the new Allocator 5 wizard in the release of CommunityViz v. 5.0) modules in the model.

Future growth allocated for Connect 2045 represented a thirty-two-year period — 2013 to 2045. Interim horizon periods were not considered in the CommunityViz model, and this data, when needed, was developed by the TJ COG assuming equal increment growth for each year in the planning horizon (i.e., total growth anticipated for the thirty-two-year horizon, divided by thirty-two years, and multiplied by the number of years for an interim horizon period of interest).

TJ COG also led an initiative in 2014 to update model input data for CommunityViz with the MPO member jurisdictions, namely parcel-level assignments for development status and place type in the region. This process is described in a TJ COG memorandum *Triangle CommunityViz 2: Place Type and Development Status Key Points*. One additional development status category — redevelopable — was added to the available options for Connect 2045.

Interim horizon periods were again not considered in CommunityViz, and this data, when needed, was developed by the TJ COG assuming equal increment growth for each year in the planning horizon (i.e., total growth anticipated for the thirty-two year horizon, divided by thirty two years, and multiplied by the number of years for an interim horizon period of interest).

Parcel-level data (input files) was collected for six of the sixteen sub-region models that are part of the Connect 2045 CommunityViz Model. It was downloaded from the TJ COG website in March 2018. Grid-level data (growth allocation files) was collected from a TJ COG share file site in March 2018.

3. CommunityViz Application

A simple CommunityViz model was created to summarize input and output data in the FLUSA and various sub-geographies. Parcel-level data and grid-cell-level data for the three scenario planning initiatives were clipped to the FLUSA boundary and made dynamic so that equations could be written to summarize the data.

Indicators used in CommunityViz measured statistics for each of the scenarios. They summarized conditions using a single statistic similar to the “field summarize” function in ArcGIS. Results were displayed in tables for monitoring conditions inside CommunityViz. Indicators updated automatically using formulas written in the software that responded to changes made in other areas of the analysis.

Indicator values were exported into Microsoft Excel for sharing summary statistics with NCTA team members (see ICE Memo #4, Appendix A).

4. Reporting Geographies

Statistics summarizing input and output data values for the three scenario planning initiatives were reported for the FLUSA boundary. Parcels and grid cells inside the study area were also tagged with county name, watershed identification number, and city/town affiliation (if appropriate) for reporting sub-geography data values.

5. Input Data Comparison Categories

Two categories of CommunityViz input data were studied for this memorandum, including:

5.1 Development Status

Development status for the three scenario planning initiatives told the sub-region models which set of equations to use for estimating the development yield (build-out potential) of a parcel. And when combined with the land suitability score and place type assignment, it established the order and supply available for a grid cell to receive future growth in the regional model.

Development status for Imagine 2040 was assigned to parcels in the region using aerial photography, property appraiser data, and topic-specific GIS data sets (e.g., existing land use, farmland, or vacant land inventories). Emphasis on one or more of the data sets varied by the category being coded. Category descriptions are provided in the *Imagine 2040 Triangle Region Scenario Planning Initiative Summary Document*. Development status assignments for Imagine 2040 were changed for the Complete 540 No Build scenario planning initiative using input from meetings with area planners in all of the FLUSA area jurisdictions, as well as with the CAMPO and TJ COG.

The TJ COG led an initiative in 2015 to update development status for the Triangle Region, which was used for the Connect 2045 scenario planning initiative. Area planners in the FLUSA provided their comments and changes via an ArcGIS Online web portal. The update of development status in the region also identified a new development status category for the region — “redevelopable”. This is a sub-category of the “under-developed” category assumed for the Imagine 2040 and Complete 540 No Build scenario planning initiatives. The update process for Connect 2045 is described in a memorandum from TJ COG entitled *Summary Document* and *the Triangle CommunityViz 2 Place Type and Development Status Key Points Memorandum*.

5.2 Place Type

Place types in the Triangle Region CommunityViz Model told the sub-region models which set of density or intensity controls to use for estimating development potential, and built confidence with cities, towns, and counties in the modeling process. Place types were combined with the land suitability score and development status assignment to allocate future growth to grid cells in the regional model.

Appendix A: Memorandum to File Regarding Connect 2045 Regional Forecasts Adopted by CAMPO on February 21, 2018, Comparison to Original Complete 540 ICE Land Use Analysis May 2018

Place types for Imagine 2040 were assigned to parcels in the region using development status values (see discussion above) and various GIS data sources. Developed parcels relied on aerial photography, property appraiser data, specific GIS data available for a jurisdiction (e.g., park or church locations), and fieldwork. Parcels assigned undeveloped, under-developed, or agriculture development status relied on committed development data or locally-adopted comprehensive plans and zoning ordinances. A place type classification matrix prepared for each city, town, and county translated comprehensive plan land use categories or zoning districts to place types for Imagine 2040 (see Section E in the *Place Types for Imagine 2040* document). Parcels assigned permanent open space or water development status were assigned 'parks and open space' for place type.

Place type assignments for Imagine 2040 were changed for the Complete 540 No Build scenario planning initiative using input from meetings with area planners in all of the FLUSA area jurisdictions, as well as with the CAMPO and TJ COG.

The TJ COG led an initiative in 2015 to update place types for the Triangle Region, which was used for the Connect 2045 scenario planning initiative. Area planners in the FLUSA provided their comments and changes via an ArcGIS Online web portal. No changes to the place type categories were made between the three scenario planning initiatives. The update process for Connect 2045 is described in a memorandum from TJ COG entitled *Summary Document and the Triangle CommunityViz 2 Place Type and Development Status Key Points Memorandum*.

6. Input Data Comparison Table

Development status and place type data for the Imagine 2040 and Connect 2045 scenario planning initiatives are summarized in the set of tables provided in the Technical Appendix. Generally speaking, the updates to development status and place types made by member jurisdictions, the TJ COG, or the two MPOs (the data development team) were notable for some categories in the FLUSA. However, the type of, and the complements between, changes to categories (some positive, some negative) should not have a significant impact on the processes used in CommunityViz to assign future growth, especially when aggregating data to the TAZ-level for watershed or traffic impact analysis purposes. Note that interviews with the data development team were not conducted as part of this investigation.

Related to summary statistics for the development status assignments, the change in number of acres assigned "agriculture" (+5%) and "undeveloped" (-6%) should not change the processes by which CommunityViz identifies parcels for future development because the scripts are written to treat both categories exactly the same in the models (see the DEV_AREA and BUILD_AREA scripts created for the two CommunityViz models). The increase in "developed" acres (+2%) between the two scenarios likely represents new development observed on the ground between the two base years, 2010 for Imagine 2040 and 2013 for Connect 2045. The change in "under-developed" status (-1%) may reflect a change in opinion from certain data development team members in terms of the amount of land likely to redevelop in the future. This category has always been the most qualitative of the choices, and relies significantly on planners' judgement for assignment. Note the Connect 2045 initiative also introduced the category "redevelopable" to help identify areas likely to redevelop, which again was assigned subjectively by the data development team.

Appendix A: Memorandum to File Regarding Connect 2045 Regional Forecasts Adopted by CAMPO on February 21, 2018, Comparison to Original Complete 540 ICE Land Use Analysis
May 2018

Related to summary statistics for place type assignments, twenty-two categories had some level of change — ranging between 1 and 8,583 acres — between Imagine 2040 and Connect 2045. Again, most of the categories changed very little in terms of percent difference after the data development team revised the input data for Connect 2045. The most notable changes were for the “working farm” (+2%), “small-lot residential neighborhood” (-3%), and “shade tree neighborhood” (+1%) categories. Some change in growth allocation may have been influenced by the new working farm category assignments — because allowable development densities were assumed to be lower in working farm compared to all other place type categories that allow residential development —but it is not assumed to be a significant driver for any change between growth allocated for the two scenario planning initiatives. The two other categories with percent change greater than one — small-lot residential neighborhood and shade tree residential neighborhood — both assume 100% single-family detached homes and similar densities as default values. Reassignment of parcels between these two place type categories also should not have a significant impact on the growth allocation results for CommunityViz. Small changes for the other 19 place type categories could have some impact on the type, pattern and intensity of development assumed in CommunityViz for Connect 2045, but all of the percent change measured for those categories was less than 1%.

This distribution of place type changes between Imagine 2040 and Connect 2045 in the FLUSA is illustrated on Figure A2 in the Technical Appendix to this memorandum.

7. Output Data Comparison Categories

Two categories of CommunityViz output data were studied for this memorandum, including:

7.1 Total Dwelling Units

Total dwelling units allocated for the three scenario planning initiatives represent the sum of single-family dwelling units and multifamily dwelling units in the CommunityViz data sets.

7.2 Total Employees

Total employees allocated for the three scenario planning initiatives represent the sum of highway retail, industrial, office, retail, and service employee categories in the CommunityViz data sets.

8. Output Data Comparison Table

Total dwelling unit and total employees data for the three scenario planning initiatives is summarized in the attached table (last page of the Technical Appendix). GIS data (grid cell level) for comparing the three scenario planning initiatives was provided to Michael Baker Engineering and HNTB in March and April 2018.

9. Technical Appendix

A compilation of tables and documents referenced in this memorandum is provided in the technical appendix.

**Memorandum to File Regarding Connect 2045
Regional Forecasts Adopted by CAMPO on
February 21, 2018**

(Comparison to Original Complete 540 ICE Land Use Analysis)

For

Complete 540 – Triangle Expressway Southeast Extension

Wake and Johnston Counties, North Carolina

STIP Nos. R-2721, R-2828 & R-2829

Technical Appendix

Figure A1 – Map of the Future Land Use Study Area for the Complete 540 Quantitative ICE

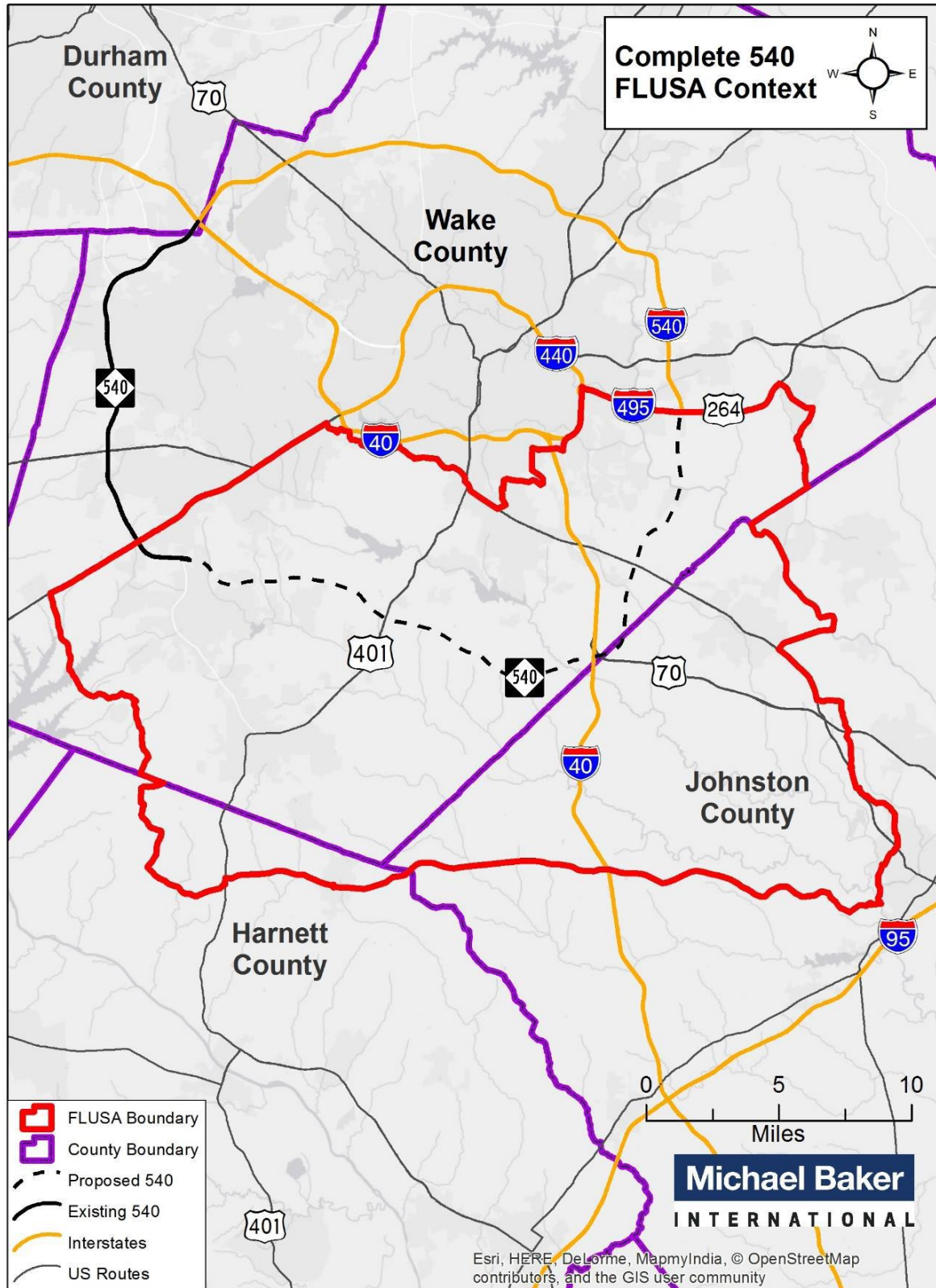
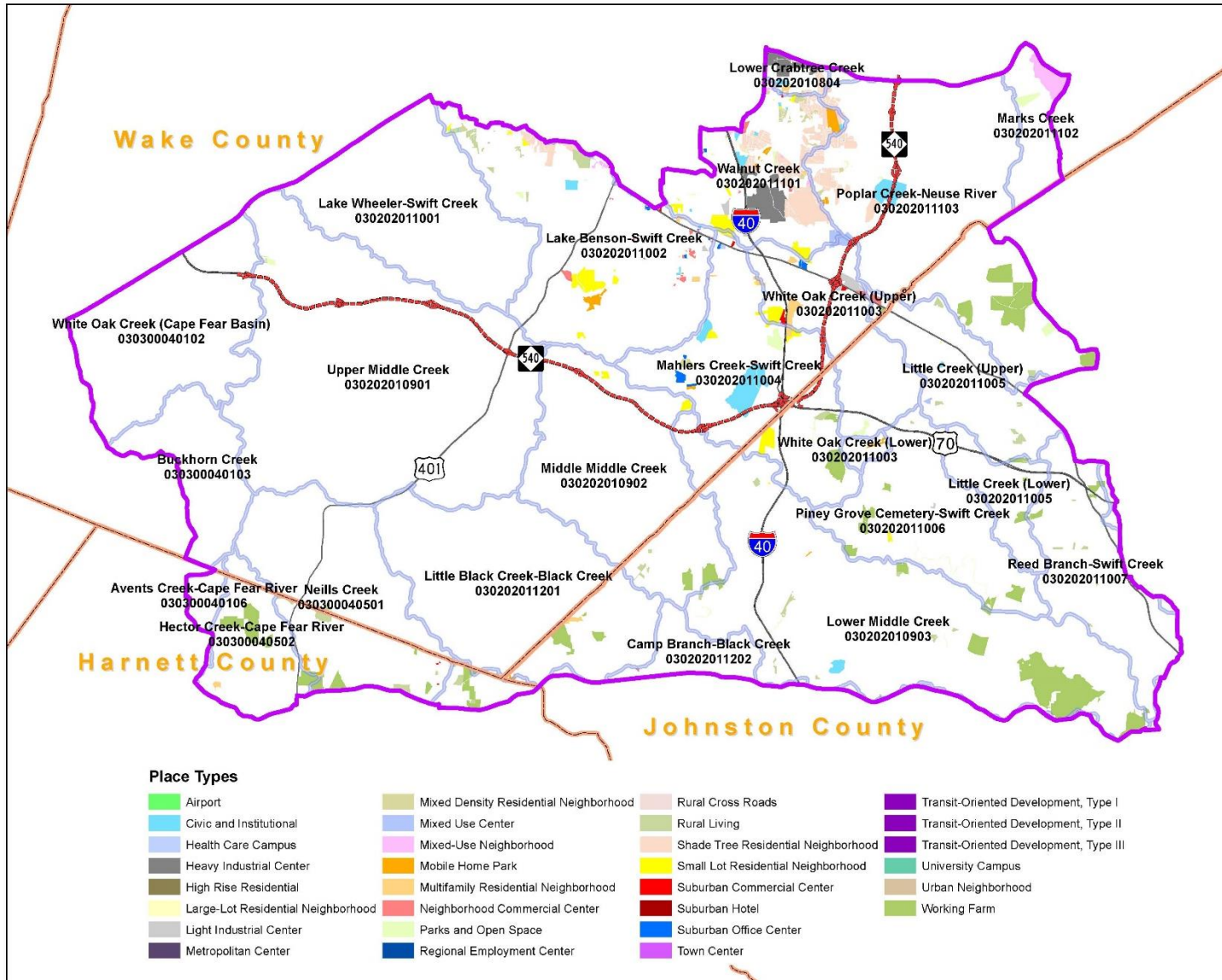


Figure A2 – Map of the Future Land Use Study Area for the Complete 540 Quantitative ICE

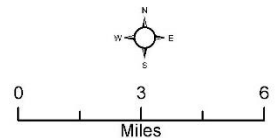


Complete 540

Imagine 2040 to
Connect 2045
Place Type Changes

Legend

- FLUSA Boundary
- Counties
- Proposed 540
- Major Highways



Michael Baker
INTERNATIONAL



Triangle CommunityViz2

Understanding and Examining Current Development and Future Growth

Place Type & Development Status – Key Points

June 9, 2014

Durham-Chapel Hill-Carrboro Metropolitan Planning Organization ♦ Capital Area Metropolitan Planning Organization
North Carolina DOT ♦ Triangle Transit ♦ Triangle J Council of Governments

CommunityViz is a computerized growth allocation tool. To use it, we will inventory current development, estimate development already underway, and develop future growth forecasts. To allocate growth, the CommunityViz model needs to know two things for every parcel in the modeled area:

1. What kind of development is expected to be on the parcel for the development scenario under consideration, termed “place type” and
2. The current status of development on the parcel (relative to its scenario place type).

I. Place Type. Most Important Point: Place Type is related to, but not the same as, “land use.” Place types can be assigned to parcels to create a scenario that closely resembles a community’s future land use plan. And place types can be assigned to parcels, and combined with parcels’ current development status, to create a scenario that closely resembles a current land use map.

Every parcel is pre-populated with the place type and development status used for the 2040 Metropolitan Transportation Plan. This is for ease of editing and does not imply that parcel place type and development status designations should be the same as the 2040 forecast developed in 2011. Initially, each parcel will receive a place type for two scenarios; for the vast majority of parcels, these place types will likely be the same; additional scenarios will be developed later:

- “2013 Inventory Scenario” Place Type: Of the 30 choices, which most closely matches what is either there today (if it has existing development on it) or what would be built today under current zoning if the site is undeveloped or under-developed and someone were to come in for a building permit? The “2013 Inventory Scenario” Place Type might be thought of as the development that is on the site today or would occur absent any policy actions by the community.
- “2045 Default Scenario” Place Type: What is the most likely choice of the 30 available types for what this parcel would be in the future, given the locally-appropriate combination of current zoning, local and regional plans, and local development trends and practices?

II. Development Status. Most Important Point: Development Status is ***always*** the status ***today*** relative to the place type in the scenario under consideration.

Every parcel will be assigned a development status from 8 possible choices, shown in the table below. Five of these choices are designed to help people understand how development on the parcel ***today*** relates to what is most likely to be on the parcel in the year 2045 for the “default 2045” MTP scenario, which is based on the 2040 adopted MTP scenario. Two of the choices – “water” and “open space” – are designed to avoid confusion when selecting a development status, since a parcel consisting of water would logically be thought of as undeveloped, but for the purposes of allocating growth, it needs to be treated as if it is fully developed, i.e., it can accommodate no additional development. The final choice – “agriculture” is available to allow a calculation of how much agricultural land is converted to development under a growth allocation.

Development Status	What it means	How CommunityViz will actually treat it	What other information is needed?
Developed	The parcel will be the same in 2045 as it is in 2013	As fully developed – no additional growth	
Undeveloped	The parcel will develop based on the CV2 algorithm	As able to add 100% of the place type capacity	
Under-developed	The parcel will develop based on the CV2 algorithm	As able to add only the % of the place type capacity that is not already on the site	The % of the site capacity that exists and will stay (pull down menu)
Redevelopable	The parcel will develop based on the CV2 algorithm	As able to add 100% of the place type capacity -- but the existing development will be subtracted	Dwellings & non-residential square footage that exist and will be removed
Committed	Development of the parcel will be asserted prior to the CV2 model run	As fully developed – no additional growth. The committed development is manually added.	Dwellings & non-residential square footage that will be on the site
Water Open Space	The parcel will be the same in 2045 as it is in 2013	As fully developed – no additional growth	
Agriculture	The parcel will develop based on the CV2 algorithm	As able to accommodate 100% of the place type capacity	Any easements or other protections that would preclude development

Like the place type designations, two initial development status designations are needed, one for each corresponding scenario:

- “2013 Inventory Scenario” development status: of the 8 choices, which most closely matches the **current** status of the parcel relative to its “2013 Inventory Scenario” Place Type?
- “2045 Default Scenario” development status: of the 8 choices, which most closely matches the **current** status of the parcel relative to its “2045 Default Scenario” Place Type?

In the vast majority of cases, the development status for the 2013 base year inventory scenario will be the same as for the 2045 default scenario. For example, any parcel that is currently undeveloped or agriculture will always have an undeveloped or agriculture development status under any scenario. Development status would differ from the 2013 inventory to the 2045 default scenario (or any other scenarios) only in those cases where what is on the parcel today may be subject to redevelopment.

Questions? Don’t hesitate to contact John Hodges-Copple at 919-558-9320 or johnhc@tjicog.org.

Comparative 30-Year Forecast Data for Complete 540 Future Land Use Study Area and Watersheds

Reporting Geography	Connect Our Future 30-Year Planning Period		Imagine Our Future 30-Year Planning Period		Complete 540 No Build Scenario (NB2) 30-Year Planning Period		Difference Connect Our Future Minus Imagine Our Future		Difference Connect Our Future Minus Complete 540 NB2	
	Total Dwelling Units	Total Employees	Total Dwelling Units	Total Employees	Total Dwelling Units	Total Employees	Total Dwelling Units	Total Employees	Total Dwelling Units	Total Employees
Future Land Use Study Area (FLUSA)										
Inside FLUSA Boundary	127,726	81,331	144,775	89,654	137,677	83,604	-17,049	-8,323	-9,951	-2,273
Watershed Area - ID Number										
White Oak Creek (Lower) - 1	205	290	247	97	246	91	-42	193	-41	199
Avents Creek-Cape Fear River - 2	132	0	151	60	141	47	-19	-60	-9	-47
Hector Creek-Cape Fear River - 3	495	1	768	99	784	118	-273	-98	-289	-117
Camp Branch-Black Creek - 4	159	0	321	47	283	44	-162	-47	-124	-44
Neills Creek - 5	13,802	2,606	12,529	5,595	12,258	5,535	1,273	-2,989	1,544	-2,929
Little Black Creek-Black Creek - 6	7,450	5,283	9,942	2,649	9,410	2,570	-2,492	2,634	-1,960	2,713
Buckhorn Creek - 7	5,436	727	6,577	1,598	6,475	1,582	-1,141	-871	-1,039	-855
Lower Middle Creek - 8	3,764	218	5,324	2,387	4,602	1,998	-1,560	-2,169	-838	-1,780
Reed Branch-Swift Creek - 9	2,393	588	2,231	1,261	2,050	1,174	162	-673	343	-586
Piney Grove Cemetery-Swift Creek - 10	1,702	3,349	2,131	1,106	1,957	934	-429	2,243	-255	2,415
Middle Middle Creek - 11	5,494	4	7,302	356	5,946	273	-1,808	-352	-452	-269
White Oak Creek (Cape Fear Basin) - 12	6,181	15,241	11,513	22,584	11,323	21,947	-5,332	-7,343	-5,142	-6,706
Little Creek (Lower) - 13	1,074	0	1,123	0	1,090	0	-49	0	-16	0
Upper Middle Creek - 14	25,828	11,054	29,519	20,493	29,536	17,845	-3,691	-9,439	-3,708	-6,791
Mahlers Creek-Swift Creek - 15	7,755	8,233	10,474	7,723	9,500	7,091	-2,719	510	-1,745	1,142
Lake Benson-Swift Creek - 16	7,941	6,459	6,938	3,848	6,873	3,818	1,003	2,611	1,068	2,641
Lake Wheeler-Swift Creek - 17	1,750	4,008	1,860	3,698	1,821	3,631	-110	310	-71	377
Walnut Creek - 18	8,680	6,165	12,590	3,634	12,587	3,481	-3,910	2,531	-3,907	2,684
Poplar Creek-Neuse River - 19	19,845	4,515	15,045	2,884	13,047	2,693	4,800	1,631	6,798	1,822
Marks Creek - 20	1,264	83	2,036	242	2,023	229	-772	-159	-759	-146
Lower Crabtree Creek - 21	260	998	254	1,016	254	948	6	-18	6	50
White Oak Creek (Upper) - 22	4,322	9,716	4,797	7,225	4,363	6,807	-475	2,491	-41	2,909
Little Creek (Upper) - 23	3,171	3,796	2,505	3,861	2,473	3,504	666	-65	698	292
Twenty-Three Basin Area	129,103	83,334	146,177	92,463	139,042	86,360	-17,074	-9,129	-9,939	-3,026

* In some cases, grid cells that summarize watershed areas include small areas beyond the curvilinear FLUSA boundary line. This spatial arrangement of watershed area grid cells aggregates slightly more area than the FLUSA boundary, and thus results in slightly higher figures than FLUSA totals..

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in the FLUSA

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Future Land Use Study Area (FLUSA)						
Development Status Assignments						
Permanent Open Space	17,799	7%	18,064	7%	-265	0%
Water	989	0%	892	0%	97	0%
Agriculture	80,777	31%	68,280	26%	12,497	5%
Undeveloped	67,054	25%	83,890	32%	-16,836	-6%
Developed	88,871	34%	83,582	32%	5,289	2%
Under-Developed	6,705	3%	8,855	3%	-2,150	-1%
Redevelopment Potential	1,229	0%	0	0%	1,229	0%
Committed Development	54	0%	0	0%	54	0%
Missing Data	85	0%	0	0%	85	0%
FLUSA Totals	263,563	100%	263,563	100%	0	0%
Place Type Assignments						
Permanent Open Space	17,619	7%	18,063	7%	-444	0%
Working Farm	6,518	2%	996	0%	5,522	2%
Rural Living	14,515	6%	13,696	5%	819	0%
Large-Lot Residential Neighborhood	37,569	14%	38,352	15%	-783	0%
Small-Lot Residential Neighborhood	141,877	54%	150,460	57%	-8,583	-3%
Shade Tree Residential Neighborhood	2,778	1%	0	0%	2,778	1%
Mobile Home Park	2,147	1%	1,871	1%	277	0%
Mixed-Density Residential Neighborhood	1,979	1%	2,331	1%	-352	0%
Multifamily Neighborhood	2,058	1%	2,111	1%	-53	0%
Urban Neighborhood	530	0%	615	0%	-85	0%
Rural Cross Roads	12	0%	12	0%	0	0%
Neighborhood Commercial Center	991	0%	1,344	1%	-353	0%
Suburban Shopping Center	7,117	3%	7,343	3%	-226	0%
Suburban Hotel	37	0%	34	0%	3	0%
Suburban Office Center	2,636	1%	2,519	1%	117	0%
Health Care Campus	105	0%	94	0%	11	0%
Regional Employment Center	328	0%	328	0%	0	0%
Light Industrial Center	7,183	3%	8,331	3%	-1,148	0%
Heavy Industrial Center	4,635	2%	4,289	2%	346	0%
Civic & Institutional	7,422	3%	6,159	2%	1,263	0%
Airport	594	0%	594	0%	0	0%
University Center	134	0%	134	0%	0	0%
Town Center	134	0%	133	0%	1	0%
Mixed-Use Neighborhood	1,613	1%	941	0%	672	0%
Mixed-Use Activity Center	1,912	1%	1,780	1%	132	0%
Transit-Oriented Development II	1,035	0%	1,035	0%	0	0%
Missing Data	85	0%	0	0%	85	0%
FLUSA Totals	263,563	100%	263,563	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 1

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 1						
Development Status Assignments						
Permanent Open Space	0	0%	0	0%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	40	6%	40	6%	0	0%
Undeveloped	435	62%	463	66%	-28	-4%
Developed	187	27%	181	26%	6	1%
Under-Developed	35	5%	12	2%	22	3%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	696	100%	696	100%	0	0%
Place Type Assignments						
Permanent Open Space	0	0%	0	0%	0	0%
Working Farm	0	0%	0	0%	0	0%
Rural Living	61	9%	61	9%	0	0%
Large-Lot Residential Neighborhood	112	16%	112	16%	0	0%
Small-Lot Residential Neighborhood	454	65%	477	68%	-22	-3%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	22	3%	0	0%	22	3%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	1	0%	1	0%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	0	0%	0	0%	0	0%
Suburban Shopping Center	27	4%	27	4%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	0	0%	0	0%	0	0%
Heavy Industrial Center	0	0%	0	0%	0	0%
Civic & Institutional	18	3%	18	3%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	696	100%	696	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 2

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 2						
Development Status Assignments						
Permanent Open Space	0	0%	0	0%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	704	73%	704	73%	0	0%
Undeveloped	74	8%	78	8%	-3	0%
Developed	173	18%	169	18%	3	0%
Under-Developed	17	2%	17	2%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	967	100%	967	100%	0	0%
Place Type Assignments						
Permanent Open Space	0	0%	0	0%	0	0%
Working Farm	0	0%	0	0%	0	0%
Rural Living	131	13%	131	13%	0	0%
Large-Lot Residential Neighborhood	23	2%	23	2%	0	0%
Small-Lot Residential Neighborhood	777	80%	777	80%	0	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	6	1%	6	1%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	0	0%	0	0%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	0	0%	0	0%	0	0%
Suburban Shopping Center	13	1%	13	1%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	19	2%	19	2%	0	0%
Heavy Industrial Center	0	0%	0	0%	0	0%
Civic & Institutional	0	0%	0	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	967	100%	967	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 3

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 3						
Development Status Assignments						
Permanent Open Space	24	0%	24	0%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	2,616	45%	2,561	44%	55	1%
Undeveloped	2,307	39%	2,426	41%	-119	-2%
Developed	861	15%	797	14%	64	1%
Under-Developed	38	1%	38	1%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	5,846	100%	5,846	100%	0	0%
Place Type Assignments						
Permanent Open Space	24	0%	24	0%	0	0%
Working Farm	559	10%	0	0%	559	10%
Rural Living	474	8%	474	8%	0	0%
Large-Lot Residential Neighborhood	1,979	34%	2,287	39%	-308	-5%
Small-Lot Residential Neighborhood	2,553	44%	2,825	48%	-273	-5%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	0	0%	0	0%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	22	0%	0	0%	22	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	0	0%	0	0%	0	0%
Suburban Shopping Center	75	1%	75	1%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	63	1%	63	1%	0	0%
Heavy Industrial Center	95	2%	95	2%	0	0%
Civic & Institutional	2	0%	2	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	5,846	100%	5,846	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 4

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 4						
Development Status Assignments						
Permanent Open Space	8	0%	8	0%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	1,238	41%	1,238	41%	0	0%
Undeveloped	935	31%	1,157	38%	-222	-7%
Developed	873	29%	651	21%	222	7%
Under-Developed	0	0%	0	0%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	3,054	100%	3,054	100%	0	0%
Place Type Assignments						
Permanent Open Space	8	0%	8	0%	0	0%
Working Farm	0	0%	0	0%	0	0%
Rural Living	330	11%	330	11%	0	0%
Large-Lot Residential Neighborhood	725	24%	724	24%	2	0%
Small-Lot Residential Neighborhood	1,965	64%	1,966	64%	-2	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	6	0%	6	0%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	0	0%	0	0%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	5	0%	0	0%	5	0%
Suburban Shopping Center	14	0%	19	1%	-5	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	0	0%	0	0%	0	0%
Heavy Industrial Center	0	0%	0	0%	0	0%
Civic & Institutional	0	0%	0	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	3,054	100%	3,054	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 5

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 5						
Development Status Assignments						
Permanent Open Space	519	4%	519	4%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	6,108	44%	6,058	44%	49	0%
Undeveloped	2,572	19%	2,807	20%	-235	-2%
Developed	4,528	33%	4,393	32%	135	1%
Under-Developed	152	1%	101	1%	51	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	13,878	100%	13,878	100%	0	0%
Place Type Assignments						
Permanent Open Space	519	4%	519	4%	0	0%
Working Farm	821	6%	544	4%	278	2%
Rural Living	1,160	8%	916	7%	244	2%
Large-Lot Residential Neighborhood	851	6%	854	6%	-3	0%
Small-Lot Residential Neighborhood	8,499	61%	8,936	64%	-437	-3%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	19	0%	19	0%	0	0%
Mixed-Density Residential Neighborhood	441	3%	443	3%	-2	0%
Multifamily Neighborhood	215	2%	215	2%	0	0%
Urban Neighborhood	116	1%	116	1%	0	0%
Rural Cross Roads	5	0%	5	0%	0	0%
Neighborhood Commercial Center	16	0%	16	0%	0	0%
Suburban Shopping Center	522	4%	521	4%	1	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	155	1%	155	1%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	115	1%	115	1%	0	0%
Heavy Industrial Center	120	1%	120	1%	0	0%
Civic & Institutional	137	1%	137	1%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	38	0%	38	0%	0	0%
Mixed-Use Neighborhood	80	1%	131	1%	-52	0%
Mixed-Use Activity Center	48	0%	77	1%	-29	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	13,878	100%	13,878	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 6

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 6						
Development Status Assignments						
Permanent Open Space	299	2%	299	2%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	10,362	54%	10,079	52%	283	1%
Undeveloped	3,967	21%	4,500	23%	-533	-3%
Developed	4,407	23%	4,176	22%	231	1%
Under-Developed	222	1%	203	1%	18	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	19,257	100%	19,257	100%	0	0%
Place Type Assignments						
Permanent Open Space	299	2%	299	2%	0	0%
Working Farm	284	1%	0	0%	284	1%
Rural Living	1,728	9%	1,724	9%	4	0%
Large-Lot Residential Neighborhood	627	3%	627	3%	0	0%
Small-Lot Residential Neighborhood	14,963	78%	15,271	79%	-308	-2%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	307	2%	299	2%	8	0%
Mixed-Density Residential Neighborhood	7	0%	40	0%	-33	0%
Multifamily Neighborhood	122	1%	77	0%	45	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	0	0%	0	0%	0	0%
Suburban Shopping Center	134	1%	134	1%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	45	0%	45	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	650	3%	650	3%	0	0%
Heavy Industrial Center	78	0%	78	0%	0	0%
Civic & Institutional	13	0%	13	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	19,257	100%	19,257	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 7

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 7						
Development Status Assignments						
Permanent Open Space	218	4%	218	4%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	2,527	41%	2,527	41%	0	0%
Undeveloped	1,478	24%	1,478	24%	0	0%
Developed	1,857	30%	1,857	30%	0	0%
Under-Developed	90	1%	90	1%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	6,170	100%	6,170	100%	0	0%
Place Type Assignments						
Permanent Open Space	308	5%	308	5%	0	0%
Working Farm	0	0%	0	0%	0	0%
Rural Living	372	6%	372	6%	0	0%
Large-Lot Residential Neighborhood	720	12%	720	12%	0	0%
Small-Lot Residential Neighborhood	3,875	63%	3,875	63%	0	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	94	2%	94	2%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	17	0%	17	0%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	0	0%	0	0%	0	0%
Suburban Shopping Center	0	0%	0	0%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	0	0%	0	0%	0	0%
Heavy Industrial Center	456	7%	456	7%	0	0%
Civic & Institutional	0	0%	0	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	326	5%	326	5%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	6,170	100%	6,170	100%	0	0%

**Complete 540 CommunityViz Model Input Data Comparison
Development Status & Place Type Assignments by Scenario in Watershed ID Number 8**

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 8						
Development Status Assignments						
Permanent Open Space	88	0%	87	0%	1	0%
Water	12	0%	25	0%	-13	0%
Agriculture	12,740	43%	11,300	38%	1,440	5%
Undeveloped	7,550	25%	10,747	36%	-3,197	-11%
Developed	8,253	28%	6,088	20%	2,165	7%
Under-Developed	1,183	4%	1,602	5%	-419	-1%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	23	0%	0	0%	23	0%
Watershed Totals	29,849	100%	29,849	100%	0	0%
Place Type Assignments						
Permanent Open Space	128	0%	102	0%	26	0%
Working Farm	1,919	6%	0	0%	1,919	6%
Rural Living	2,416	8%	2,280	8%	136	0%
Large-Lot Residential Neighborhood	5,562	19%	5,587	19%	-26	0%
Small-Lot Residential Neighborhood	18,180	61%	19,137	64%	-957	-3%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	212	1%	209	1%	4	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	7	0%	7	0%	0	0%
Urban Neighborhood	0	0%	23	0%	-23	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	11	0%	11	0%	0	0%
Suburban Shopping Center	937	3%	960	3%	-22	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	6	0%	6	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	73	0%	700	2%	-627	-2%
Heavy Industrial Center	141	0%	680	2%	-540	-2%
Civic & Institutional	233	1%	147	0%	86	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	23	0%	0	0%	23	0%
Watershed Totals	29,849	100%	29,849	100%	0	0%

**Complete 540 CommunityViz Model Input Data Comparison
Development Status & Place Type Assignments by Scenario in Watershed ID Number 9**

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 9						
Development Status Assignments						
Permanent Open Space	18	0%	18	0%	0	0%
Water	6	0%	6	0%	0	0%
Agriculture	3,355	35%	3,282	34%	73	1%
Undeveloped	3,443	36%	3,748	39%	-306	-3%
Developed	2,434	25%	2,278	24%	155	2%
Under-Developed	319	3%	304	3%	15	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	62	1%	0	0%	62	1%
Watershed Totals	9,636	100%	9,636	100%	0	0%
Place Type Assignments						
Permanent Open Space	23	0%	23	0%	0	0%
Working Farm	67	1%	0	0%	67	1%
Rural Living	188	2%	149	2%	40	0%
Large-Lot Residential Neighborhood	984	10%	984	10%	0	0%
Small-Lot Residential Neighborhood	6,695	69%	6,735	70%	-39	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	39	0%	39	0%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	0	0%	0	0%	0	0%
Urban Neighborhood	36	0%	98	1%	-62	-1%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	109	1%	109	1%	0	0%
Suburban Shopping Center	274	3%	342	4%	-68	-1%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	1	0%	1	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	535	6%	535	6%	0	0%
Heavy Industrial Center	85	1%	85	1%	0	0%
Civic & Institutional	5	0%	5	0%	0	0%
Airport	531	6%	531	6%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	62	1%	0	0%	62	1%
Watershed Totals	9,636	100%	9,636	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 10

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 10						
Development Status Assignments						
Permanent Open Space	222	2%	222	2%	0	0%
Water	35	0%	0	0%	35	0%
Agriculture	2,809	28%	2,419	24%	390	4%
Undeveloped	3,738	37%	5,109	51%	-1,371	-14%
Developed	3,221	32%	2,284	23%	937	9%
Under-Developed	67	1%	58	1%	9	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	10,092	100%	10,092	100%	0	0%
Place Type Assignments						
Permanent Open Space	320	3%	304	3%	16	0%
Working Farm	390	4%	0	0%	390	4%
Rural Living	958	9%	1,027	10%	-69	-1%
Large-Lot Residential Neighborhood	2,587	26%	2,587	26%	0	0%
Small-Lot Residential Neighborhood	5,487	54%	5,831	58%	-344	-3%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	0	0%	0	0%	0	0%
Mixed-Density Residential Neighborhood	48	0%	48	0%	0	0%
Multifamily Neighborhood	23	0%	23	0%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	2	0%	2	0%	0	0%
Suburban Shopping Center	135	1%	135	1%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	7	0%	0	0%	7	0%
Heavy Industrial Center	0	0%	0	0%	0	0%
Civic & Institutional	0	0%	0	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	135	1%	135	1%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	10,092	100%	10,092	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 11

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 11						
Development Status Assignments						
Permanent Open Space	589	4%	584	4%	4	0%
Water	3	0%	3	0%	0	0%
Agriculture	5,070	32%	4,050	25%	1,021	6%
Undeveloped	3,678	23%	5,158	32%	-1,480	-9%
Developed	6,651	41%	5,992	37%	660	4%
Under-Developed	48	0%	289	2%	-241	-2%
Redevelopment Potential	37	0%	0	0%	37	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	16,077	100%	16,077	100%	0	0%
Place Type Assignments						
Permanent Open Space	596	4%	596	4%	0	0%
Working Farm	285	2%	0	0%	285	2%
Rural Living	804	5%	760	5%	44	0%
Large-Lot Residential Neighborhood	1,758	11%	1,758	11%	0	0%
Small-Lot Residential Neighborhood	12,398	77%	12,634	79%	-235	-1%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	66	0%	104	1%	-37	0%
Mixed-Density Residential Neighborhood	0	0%	46	0%	-46	0%
Multifamily Neighborhood	8	0%	8	0%	0	0%
Urban Neighborhood	8	0%	8	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	7	0%	4	0%	3	0%
Suburban Shopping Center	62	0%	73	0%	-10	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	1	0%	4	0%	-3	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	0	0%	0	0%	0	0%
Heavy Industrial Center	27	0%	27	0%	0	0%
Civic & Institutional	55	0%	55	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	16,077	100%	16,077	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 12

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 12						
Development Status Assignments						
Permanent Open Space	5,129	38%	5,128	38%	1	0%
Water	0	0%	0	0%	0	0%
Agriculture	530	4%	530	4%	0	0%
Undeveloped	4,891	36%	4,893	36%	-2	0%
Developed	2,137	16%	2,136	16%	1	0%
Under-Developed	865	6%	865	6%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	13,551	100%	13,551	100%	0	0%
Place Type Assignments						
Permanent Open Space	5,135	38%	5,135	38%	1	0%
Working Farm	0	0%	0	0%	0	0%
Rural Living	1,162	9%	1,162	9%	0	0%
Large-Lot Residential Neighborhood	230	2%	230	2%	0	0%
Small-Lot Residential Neighborhood	1,160	9%	1,160	9%	0	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	0	0%	0	0%	0	0%
Mixed-Density Residential Neighborhood	762	6%	761	6%	1	0%
Multifamily Neighborhood	35	0%	37	0%	-2	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	17	0%	17	0%	0	0%
Suburban Shopping Center	243	2%	243	2%	0	0%
Suburban Hotel	4	0%	4	0%	0	0%
Suburban Office Center	1,439	11%	1,439	11%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	830	6%	830	6%	0	0%
Heavy Industrial Center	814	6%	814	6%	0	0%
Civic & Institutional	43	0%	43	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	37	0%	37	0%	0	0%
Mixed-Use Neighborhood	155	1%	155	1%	0	0%
Mixed-Use Activity Center	449	3%	449	3%	0	0%
Transit-Oriented Development II	1,035	8%	1,035	8%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	13,551	100%	13,551	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 13

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 13						
Development Status Assignments						
Permanent Open Space	8	0%	8	0%	0	0%
Water	7	0%	7	0%	0	0%
Agriculture	1,673	45%	1,504	40%	169	5%
Undeveloped	858	23%	1,178	32%	-319	-9%
Developed	1,139	31%	989	27%	150	4%
Under-Developed	34	1%	34	1%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	3,719	100%	3,719	100%	0	0%
Place Type Assignments						
Permanent Open Space	15	0%	15	0%	0	0%
Working Farm	169	5%	0	0%	169	5%
Rural Living	256	7%	249	7%	7	0%
Large-Lot Residential Neighborhood	688	18%	688	18%	0	0%
Small-Lot Residential Neighborhood	2,488	67%	2,664	72%	-176	-5%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	100	3%	100	3%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	0	0%	0	0%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	2	0%	2	0%	0	0%
Suburban Shopping Center	0	0%	0	0%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	0	0%	0	0%	0	0%
Heavy Industrial Center	0	0%	0	0%	0	0%
Civic & Institutional	0	0%	0	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	3,719	100%	3,719	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 14

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 14						
Development Status Assignments						
Permanent Open Space	2,616	8%	2,592	8%	25	0%
Water	18	0%	18	0%	0	0%
Agriculture	6,774	21%	6,774	21%	0	0%
Undeveloped	6,945	21%	7,251	22%	-306	-1%
Developed	15,080	46%	14,826	45%	253	1%
Under-Developed	1,247	4%	1,219	4%	28	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	32,681	100%	32,681	100%	0	0%
Place Type Assignments						
Permanent Open Space	2,698	8%	2,674	8%	25	0%
Working Farm	0	0%	0	0%	0	0%
Rural Living	1,222	4%	1,222	4%	0	0%
Large-Lot Residential Neighborhood	1,657	5%	1,657	5%	0	0%
Small-Lot Residential Neighborhood	21,043	64%	21,043	64%	0	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	177	1%	177	1%	0	0%
Mixed-Density Residential Neighborhood	164	1%	152	0%	12	0%
Multifamily Neighborhood	405	1%	441	1%	-36	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	2	0%	2	0%	0	0%
Neighborhood Commercial Center	157	0%	157	0%	0	0%
Suburban Shopping Center	1,640	5%	1,644	5%	-3	0%
Suburban Hotel	5	0%	2	0%	3	0%
Suburban Office Center	283	1%	283	1%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	1,667	5%	1,667	5%	0	0%
Heavy Industrial Center	376	1%	376	1%	0	0%
Civic & Institutional	723	2%	723	2%	0	0%
Airport	63	0%	63	0%	0	0%
University Center	134	0%	134	0%	0	0%
Town Center	6	0%	6	0%	0	0%
Mixed-Use Neighborhood	147	0%	147	0%	0	0%
Mixed-Use Activity Center	110	0%	110	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	32,681	100%	32,681	100%	0	0%

**Complete 540 CommunityViz Model Input Data Comparison
Development Status & Place Type Assignments by Scenario in Watershed ID Number 15**

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 15						
Development Status Assignments						
Permanent Open Space	465	4%	404	3%	61	0%
Water	10	0%	10	0%	0	0%
Agriculture	4,512	34%	2,001	15%	2,511	19%
Undeveloped	3,229	24%	5,675	43%	-2,446	-18%
Developed	4,818	36%	4,653	35%	165	1%
Under-Developed	164	1%	554	4%	-390	-3%
Redevelopment Potential	60	0%	0	0%	60	0%
Committed Development	39	0%	0	0%	39	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	13,297	100%	13,297	100%	0	0%
Place Type Assignments						
Permanent Open Space	445	3%	312	2%	133	1%
Working Farm	316	2%	40	0%	275	2%
Rural Living	314	2%	296	2%	19	0%
Large-Lot Residential Neighborhood	2,235	17%	2,253	17%	-18	0%
Small-Lot Residential Neighborhood	7,282	55%	8,281	62%	-999	-8%
Shade Tree Residential Neighborhood	0	0%		0%	0	0%
Mobile Home Park	77	1%	63	0%	14	0%
Mixed-Density Residential Neighborhood	73	1%	72	1%	1	0%
Multifamily Neighborhood	37	0%	74	1%	-37	0%
Urban Neighborhood	0	0%		0%	0	0%
Rural Cross Roads	0	0%		0%	0	0%
Neighborhood Commercial Center	25	0%	103	1%	-78	-1%
Suburban Shopping Center	829	6%	826	6%	2	0%
Suburban Hotel	0	0%		0%	0	0%
Suburban Office Center	116	1%	39	0%	77	1%
Health Care Campus	11	0%		0%	11	0%
Regional Employment Center	0	0%		0%	0	0%
Light Industrial Center	158	1%	160	1%	-2	0%
Heavy Industrial Center	241	2%	296	2%	-55	0%
Civic & Institutional	849	6%	160	1%	689	5%
Airport	0	0%		0%	0	0%
University Center	0	0%		0%	0	0%
Town Center	0	0%		0%	0	0%
Mixed-Use Neighborhood	0	0%		0%	0	0%
Mixed-Use Activity Center	289	2%	322	2%	-33	0%
Transit-Oriented Development II	0	0%		0%	0	0%
Missing Data	0	0%		0%	0	0%
Watershed Totals	13,297	100%	13,297	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 16

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 16						
Development Status Assignments						
Permanent Open Space	1,151	6%	1,496	8%	-345	-2%
Water	685	4%	685	4%	0	0%
Agriculture	4,165	23%	2,755	15%	1,410	8%
Undeveloped	3,645	20%	4,437	25%	-792	-4%
Developed	7,347	41%	7,544	42%	-197	-1%
Under-Developed	411	2%	893	5%	-482	-3%
Redevelopment Potential	404	2%	0	0%	404	2%
Committed Development	3	0%	0	0%	3	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	17,810	100%	17,810	100%	0	0%
Place Type Assignments						
Permanent Open Space	1,700	10%	1,959	11%	-259	-1%
Working Farm	0	0%	0	0%	0	0%
Rural Living	1,585	9%	1,358	8%	227	1%
Large-Lot Residential Neighborhood	5,178	29%	5,465	31%	-287	-2%
Small-Lot Residential Neighborhood	4,212	24%	4,346	24%	-134	-1%
Shade Tree Residential Neighborhood	302	2%	0	0%	302	2%
Mobile Home Park	215	1%	118	1%	97	1%
Mixed-Density Residential Neighborhood	126	1%	155	1%	-29	0%
Multifamily Neighborhood	393	2%	459	3%	-66	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	249	1%	144	1%	106	1%
Suburban Shopping Center	651	4%	743	4%	-91	-1%
Suburban Hotel	8	0%	8	0%	0	0%
Suburban Office Center	214	1%	208	1%	6	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	372	2%	359	2%	13	0%
Heavy Industrial Center	62	0%	58	0%	4	0%
Civic & Institutional	2,448	14%	2,356	13%	92	1%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	9	0%	8	0%	1	0%
Mixed-Use Neighborhood	31	0%	12	0%	19	0%
Mixed-Use Activity Center	55	0%	55	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	17,810	100%	17,810	100%	0	0%

**Complete 540 CommunityViz Model Input Data Comparison
Development Status & Place Type Assignments by Scenario in Watershed ID Number 17**

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 17						
Development Status Assignments						
Permanent Open Space	2,227	17%	2,227	17%	0	0%
Water	123	1%	123	1%	0	0%
Agriculture	328	2%	328	2%	0	0%
Undeveloped	2,093	16%	2,127	16%	-34	0%
Developed	8,235	62%	8,201	61%	34	0%
Under-Developed	382	3%	382	3%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	13,388	100%	13,388	100%	0	0%
Place Type Assignments						
Permanent Open Space	1,966	15%	1,966	15%	0	0%
Working Farm	0	0%	0	0%	0	0%
Rural Living	445	3%	445	3%	0	0%
Large-Lot Residential Neighborhood	7,077	53%	7,077	53%	0	0%
Small-Lot Residential Neighborhood	2,258	17%	2,258	17%	0	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	17	0%	17	0%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	319	2%	319	2%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	4	0%	4	0%	0	0%
Neighborhood Commercial Center	62	0%	62	0%	0	0%
Suburban Shopping Center	347	3%	347	3%	0	0%
Suburban Hotel	20	0%	20	0%	0	0%
Suburban Office Center	94	1%	94	1%	0	0%
Health Care Campus	60	0%	60	0%	0	0%
Regional Employment Center	328	2%	328	2%	0	0%
Light Industrial Center	21	0%	21	0%	0	0%
Heavy Industrial Center	0	0%	0	0%	0	0%
Civic & Institutional	159	1%	159	1%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	163	1%	163	1%	0	0%
Mixed-Use Activity Center	48	0%	48	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	13,388	100%	13,388	100%	0	0%

**Complete 540 CommunityViz Model Input Data Comparison
Development Status & Place Type Assignments by Scenario in Watershed ID Number 18**

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 18						
Development Status Assignments						
Permanent Open Space	847	10%	1,114	13%	-267	-3%
Water	6	0%	0	0%	6	0%
Agriculture	1,280	15%	408	5%	872	10%
Undeveloped	3,127	36%	3,328	38%	-202	-2%
Developed	2,782	32%	3,253	37%	-471	-5%
Under-Developed	253	3%	651	7%	-398	-5%
Redevelopment Potential	447	5%	0	0%	447	5%
Committed Development	13	0%	0	0%	13	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	8,754	100%	8,754	100%	0	0%
Place Type Assignments						
Permanent Open Space	788	9%	1,093	12%	-305	-3%
Working Farm	233	3%	233	3%	0	0%
Rural Living	30	0%	30	0%	0	0%
Large-Lot Residential Neighborhood	86	1%	91	1%	-4	0%
Small-Lot Residential Neighborhood	3,304	38%	4,900	56%	-1,596	-18%
Shade Tree Residential Neighborhood	1,605	18%	0	0%	1,605	18%
Mobile Home Park	202	2%	51	1%	151	2%
Mixed-Density Residential Neighborhood	150	2%	300	3%	-149	-2%
Multifamily Neighborhood	48	1%	158	2%	-110	-1%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	124	1%	156	2%	-32	0%
Suburban Shopping Center	78	1%	98	1%	-20	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	24	0%	15	0%	8	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	522	6%	859	10%	-337	-4%
Heavy Industrial Center	1,115	13%	471	5%	644	7%
Civic & Institutional	322	4%	212	2%	110	1%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	123	1%	87	1%	36	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	8,754	100%	8,754	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 19

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 19						
Development Status Assignments						
Permanent Open Space	2,053	9%	1,820	8%	233	1%
Water	2	0%	2	0%	0	0%
Agriculture	9,515	40%	6,294	27%	3,221	14%
Undeveloped	5,449	23%	9,111	39%	-3,662	-15%
Developed	5,597	24%	5,405	23%	191	1%
Under-Developed	818	3%	1,024	4%	-206	-1%
Redevelopment Potential	223	1%	0	0%	223	1%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	23,657	100%	23,657	100%	0	0%
Place Type Assignments						
Permanent Open Space	1,156	5%	1,371	6%	-215	-1%
Working Farm	1,126	5%	0	0%	1,126	5%
Rural Living	357	2%	317	1%	41	0%
Large-Lot Residential Neighborhood	2,333	10%	2,333	10%	0	0%
Small-Lot Residential Neighborhood	14,436	61%	16,427	69%	-1,991	-8%
Shade Tree Residential Neighborhood	765	3%	0	0%	765	3%
Mobile Home Park	365	2%	347	1%	18	0%
Mixed-Density Residential Neighborhood	162	1%	140	1%	22	0%
Multifamily Neighborhood	21	0%	31	0%	-9	0%
Urban Neighborhood	95	0%	95	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	87	0%	87	0%	0	0%
Suburban Shopping Center	73	0%	73	0%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	18	0%	18	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	370	2%	370	2%	0	0%
Heavy Industrial Center	9	0%	9	0%	0	0%
Civic & Institutional	2,075	9%	1,836	8%	239	1%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	8	0%	8	0%	0	0%
Mixed-Use Neighborhood	76	0%	73	0%	3	0%
Mixed-Use Activity Center	122	1%	122	1%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	23,657	100%	23,657	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 20

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 20						
Development Status Assignments						
Permanent Open Space	799	22%	799	22%	0	0%
Water	0	0%	0	0%	0	0%
Agriculture	556	15%	556	15%	0	0%
Undeveloped	1,749	48%	1,749	48%	0	0%
Developed	504	14%	504	14%	0	0%
Under-Developed	55	1%	55	1%	0	0%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	3,663	100%	3,663	100%	0	0%
Place Type Assignments						
Permanent Open Space	473	13%	381	10%	92	3%
Working Farm	0	0%	0	0%	0	0%
Rural Living	52	1%	52	1%	0	0%
Large-Lot Residential Neighborhood	522	14%	614	17%	-92	-3%
Small-Lot Residential Neighborhood	1,901	52%	2,569	70%	-668	-18%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	0	0%	0	0%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	0	0%	0	0%	0	0%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	0	0%	0	0%	0	0%
Suburban Shopping Center	5	0%	5	0%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	0	0%	0	0%	0	0%
Heavy Industrial Center	0	0%	0	0%	0	0%
Civic & Institutional	18	0%	18	0%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	692	19%	24	1%	668	18%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	3,663	100%	3,663	100%	0	0%

Complete 540 CommunityViz Model Input Data Comparison
 Development Status & Place Type Assignments by Scenario in Watershed ID Number 21

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 21						
Development Status Assignments						
Permanent Open Space	157	16%	151	16%	6	1%
Water	21	2%	0	0%	21	2%
Agriculture	0	0%	23	2%	-23	-2%
Undeveloped	171	18%	238	24%	-67	-7%
Developed	504	52%	531	55%	-26	-3%
Under-Developed	87	9%	30	3%	57	6%
Redevelopment Potential	33	3%	0	0%	33	3%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	973	100%	973	100%	0	0%
Place Type Assignments						
Permanent Open Space	157	16%	151	16%	6	1%
Working Farm	0	0%	0	0%	0	0%
Rural Living	0	0%	0	0%	0	0%
Large-Lot Residential Neighborhood	0	0%	0	0%	0	0%
Small-Lot Residential Neighborhood	49	5%	188	19%	-139	-14%
Shade Tree Residential Neighborhood	106	11%	0	0%	106	11%
Mobile Home Park	0	0%	0	0%	0	0%
Mixed-Density Residential Neighborhood	5	1%	0	0%	5	1%
Multifamily Neighborhood	28	3%	5	1%	23	2%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	41	4%	35	4%	6	1%
Suburban Shopping Center	2	0%	2	0%	0	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	0	0%	0	0%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	241	25%	584	60%	-343	-35%
Heavy Industrial Center	304	31%	0	0%	304	31%
Civic & Institutional	35	4%	0	0%	35	4%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	6	1%	8	1%	-2	0%
Mixed-Use Activity Center	0	0%	0	0%	0	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	973	100%	973	100%	0	0%

**Complete 540 CommunityViz Model Input Data Comparison
Development Status & Place Type Assignments by Scenario in Watershed ID Number 22**

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 22						
Development Status Assignments						
Permanent Open Space	113	1%	113	1%	0	0%
Water	60	1%	12	0%	47	1%
Agriculture	1,887	24%	913	11%	974	12%
Undeveloped	2,630	33%	3,650	46%	-1,020	-13%
Developed	3,202	40%	2,969	37%	233	3%
Under-Developed	52	1%	311	4%	-259	-3%
Redevelopment Potential	26	0%	0	0%	26	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	7,968	100%	7,968	100%	0	0%
Place Type Assignments						
Permanent Open Space	179	2%	132	2%	47	1%
Working Farm	0	0%	0	0%	0	0%
Rural Living	96	1%	129	2%	-33	0%
Large-Lot Residential Neighborhood	649	8%	696	9%	-47	-1%
Small-Lot Residential Neighborhood	4,042	51%	4,019	50%	23	0%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	64	1%	64	1%	0	0%
Mixed-Density Residential Neighborhood	1	0%	94	1%	-93	-1%
Multifamily Neighborhood	240	3%	60	1%	180	2%
Urban Neighborhood	0	0%	0	0%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	31	0%	435	5%	-404	-5%
Suburban Shopping Center	265	3%	275	3%	-10	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	113	1%	84	1%	29	0%
Health Care Campus	34	0%	34	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	1,054	13%	914	11%	141	2%
Heavy Industrial Center	683	9%	694	9%	-11	0%
Civic & Institutional	66	1%	66	1%	0	0%
Airport	0	0%	0	0%	0	0%
University Center	0	0%	0	0%	0	0%
Town Center	0	0%	0	0%	0	0%
Mixed-Use Neighborhood	0	0%	0	0%	0	0%
Mixed-Use Activity Center	450	6%	271	3%	180	2%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	7,968	100%	7,968	100%	0	0%

**Complete 540 CommunityViz Model Input Data Comparison
Development Status & Place Type Assignments by Scenario in Watershed ID Number 23**

Reporting Geography	Connect Our Future Model Input Data		Imagine Our Future Model Input Data		Difference Connect Our Future Minus Imagine Our Future	
	Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total
Watershed ID Number 23						
Development Status Assignments						
Permanent Open Space	222	3%	206	3%	16	0%
Water	0	0%	0	0%	0	0%
Agriculture	1,180	17%	1,166	17%	14	0%
Undeveloped	1,768	26%	2,190	32%	-422	-6%
Developed	3,522	52%	3,173	47%	349	5%
Under-Developed	132	2%	89	1%	43	1%
Redevelopment Potential	0	0%	0	0%	0	0%
Committed Development	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	6,824	100%	6,824	100%	0	0%
Place Type Assignments						
Permanent Open Space	652	10%	663	10%	-12	0%
Working Farm	26	0%	0	0%	26	0%
Rural Living	109	2%	1	0%	108	2%
Large-Lot Residential Neighborhood	856	13%	856	13%	0	0%
Small-Lot Residential Neighborhood	3,024	44%	3,199	47%	-175	-3%
Shade Tree Residential Neighborhood	0	0%	0	0%	0	0%
Mobile Home Park	119	2%	119	2%	0	0%
Mixed-Density Residential Neighborhood	0	0%	0	0%	0	0%
Multifamily Neighborhood	106	2%	120	2%	-15	0%
Urban Neighborhood	262	4%	262	4%	0	0%
Rural Cross Roads	0	0%	0	0%	0	0%
Neighborhood Commercial Center	45	1%	4	0%	42	1%
Suburban Shopping Center	767	11%	768	11%	-1	0%
Suburban Hotel	0	0%	0	0%	0	0%
Suburban Office Center	126	2%	126	2%	0	0%
Health Care Campus	0	0%	0	0%	0	0%
Regional Employment Center	0	0%	0	0%	0	0%
Light Industrial Center	458	7%	0	0%	458	7%
Heavy Industrial Center	19	0%	458	7%	-439	-6%
Civic & Institutional	208	3%	19	0%	189	3%
Airport	0	0%	196	3%	-196	-3%
University Center	0	0%	0	0%	0	0%
Town Center	27	0%	27	0%	0	0%
Mixed-Use Neighborhood	6	0%	6	0%	0	0%
Mixed-Use Activity Center	15	0%	0	0%	15	0%
Transit-Oriented Development II	0	0%	0	0%	0	0%
Missing Data	0	0%	0	0%	0	0%
Watershed Totals	6,824	100%	6,824	100%	0	0%