

# CTP-ICE Screening for Indirect Effects TECHNICAL MEMORANDUM (CTP-ICE Product 3 – Part 1)



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<b>To:</b>	<b>NCDOT Transportation Planning Branch Regional Unit Head, TPB NCDOT Community Studies Team Leader, HES</b>	
<b>From:</b>	<b>Staff, TPB/MPO/RPO</b>	
<b>Subject:</b>	<b>CTP-ICE Screening for Indirect Effects for the Eden 2009 CTP and for Proposed NC 14-87 Bypass (Local ID: XXXX####-#)</b>	

This Technical Memorandum documents the Comprehensive Transportation Plan-Indirect and Cumulative Effects (CTP-ICE) Screening for Indirect Effects. The first screening is a broad-level screening assessing the potential indirect effects across the entire CTP Study Area, and is called a Plan-Level Screening. The second screening, called a Project-Level Screening, focuses on a specific CTP project proposal, the NC 14-87 Bypass (Local ID: XXXX####-#).

The Transportation Planning Branch, and Metropolitan Planning Organizations (MPO) or Rural Planning Organizations (RPO) have conducted the Indirect Effects Screening of alternatives and have drafted the Technical Memorandum summarizing the results. The NCDOT Human Environment Section-Community Studies (HES-CS) staff reviewed the Indirect Effects Screening Technical Memorandum and Screening Matrices, and provided comments to the MPO/RPO and Transportation Planning Branch (TPB) Staff to ensure consistency between long-range planning and the National Environmental Policy Act (NEPA) process during project development.

## **CTP-ICE Plan-Level Screening: Eden CTP Study Area**

### ***CTP-ICE Plan-Level Screening Results for the Eden CTP Study Area***

A CTP-ICE Plan-Level Screening was conducted for the CTP Study Area, based on the multi-modal recommendations in the Draft Eden Comprehensive Transportation Plan (CTP), dated April 2009. Since the Plan-Level Screening looks at the entire CTP Study Area, the results remain unchanged from the results in Product 1, which also considers the CTP Study Area. This technical memorandum explains the analysis conducted, including use of the CTP-ICE Screening Matrix for Indirect Effects and explains the results. This Plan-Level Screening for potential indirect effects resulted in a finding of *'likely indirect effects.'* The Scope of Transportation Investments and Macro Change in Accessibility were the two factors that primarily influenced these results. The highway project proposals in the Draft CTP are major

transportation investments that would increase capacity and travel speeds, alter travel patterns, and provide access to currently undeveloped land. In addition to these two factors, the high availability of water and sewer service, large amount of available land, and sensitivity and abundance of notable environmental features contributed to the cumulative result that there are likely indirect effects from the Draft CTP scenario. The highway project proposals are anticipated to have more indirect effects than the public transportation/rail and bicycle projects, which create less change to travel speeds and capacities for the CTP Study Area overall.

## **CTP-ICE Screening Matrix for Indirect Effects, Plan-Level: Eden CTP Study Area**

Product 3: CTP - ICE Screening Matrix for Indirect Effects, Plan-Level: Eden CTP Study Area										
Rating	Scope of Trans. Plan Investments	Macro Change in Accessibility	Forecasted Population Growth	Forecasted Employment Growth	Available Land	Water/Sewer Availability	Market for Development	Public Policy	Notable Environmental Features	Result
More Concern	High	High	> 3% annual population growth	> 3% increase New Jobs Expected	40% or greater of available land*	Services available [muni 100%, county 20% of area]	Development activity abundant	Less stringent, no growth management	Notable Feature(s): Abundant / More Sensitive	
High						X				
Medium-High	X	X			X				X	Likely Indirect Effects
Medium								X		
Medium-Low			X	X			X			
Low										
Less Concern	Low	None	No population growth or decline	No new Jobs or Job Losses	0 - 9% of available land*	Limited or no service available now or in future	Development activity lacking	More stringent, growth management	Notable Feature(s): Minimal / Less Sensitive	

\*Refer to Product 3 Procedure for rating descriptions

**Figure 1 – See attached matrix for larger image**

### **CTP Project Proposals**

#### **Highway Proposals**

The highway project proposals include upgrades to several boulevards and major thoroughfares as well as a few major thoroughfares on new location. Freeways and expressways are not present in the CTP Study Area nor are they proposed in the CTP. These projects are listed below. More detailed descriptions can be found in the CTP study report:

#### **Upgrade Existing:**

- NC 14-87: New interchanges, widen existing two and three-lane sections to four-lanes with partial control of access
- SR 2066 (W. Kings Highway): Add median for partial control of access
- SR 3003 (W. Meadow Road): Widen existing two-lane road to four-lanes with partial control of access

### **New Location:**

- NC 14-87 (Bypass): Two-lane facility on primarily new location from SR 1605 to NC 87-770
- Harrington Highway Eastern Extension: Extend Harrington Highway from NC 14 to SR 1951. Facility would be two lanes
- West Draper Spur: New two-lane facility from NC 770 to Harrington Highway Eastern Extension

### **Public Transportation and Rail Proposals**

Rockingham County's Aging, Disability, and Transit Services operates the only fixed-route transit system within the CTP Study Area, named SKAT. Currently, SKAT offers one circulator route that operates completely within the City of Eden. In addition to SKAT, there is demand-response transit service within the CTP Study Area. The CTP does not propose additional transit service, but it does propose three park-and-ride lots to serve rideshares and/or vanpools. The three proposed locations are:

- SR 1604 (Washington Street) at NC 770: To serve commutes west of the CTP Study Area (e.g. Winston-Salem)
- NC 14-87-770 (Van Buren Road) at SR 1964 (Mebane Bridge Road): To serve commutes south of the CTP Study Area (e.g. Reidsville, Greensboro)
- South Avenue near NC 700: To serve commutes northeast of the CTP Study Area (e.g. Danville, VA)

In addition to public transportation, there is active rail service within the CTP Study Area. The Carolina and Northwestern Railway operates the service into Eden from Virginia. The CTP does not propose any rail projects.

### **Bicycle Proposals**

The CTP recognizes that multi-modal transportation projects are an important component of the overall transportation system and makes several bicycle project recommendations. The bicycle scenario is informed by the Piedmont-Triad Rural Planning Organization Bicycle Study (2005) and the City of Eden Greenway Master Plan (2007). Both on and off-road facilities are recommended in these plans and are incorporated in the CTP. Many of the CTP projects are to improve the safety of existing on-road bicycle routes. Other CTP projects include new off-road bicycle facilities along the Dan and Smith rivers as well as spurs connecting these paths to the downtown area. According to the CTP, pedestrian projects are still under development.

## ***Scope of Transportation Plan Investments***

*Ranking:* Medium High

The upgrades to existing highway facilities will increase capacity and travel speeds. Projects on new location would alter travel patterns such as the NC 14-87 Bypass that would divert traffic around the city as opposed to through the Central Business District. Land use would be impacted because these projects would provide access to currently undeveloped land in Eden's Extraterritorial Jurisdiction (ETJ). This land is predominantly agricultural in use with some residential development.

Although the highway scenario may impact travel patterns and land use, the magnitude of this scenario is less than the impact freeways or other large-capacity projects would have on the CTP Study Area. Additionally, the public transportation/rail and bicycle scenario projects would not be considered major investments because they would not greatly affect speeds or capacities.

The *Scope of Transportation Plan Investments* is ranked as a medium-high concern. This ranking is based on proposed highway projects that are major investments on an alternative location; both factors that may impact travel patterns and land use.

## ***Macro Change in Accessibility***

*Ranking:* Medium High

Several of the facilities would change from no control of access to partial control of access. The NC 14-87 Bypass, Harrington Highway Extension, and West Draper Spur projects would be constructed on new location and provide new access to currently undeveloped land. This access may encourage new development, particularly at intersections and interchanges, thereby changing existing land use from rural to commercial or residential in the western portion of the CTP Study Area. On the east, new access may encourage industrial development as there are currently industrial uses in the vicinity. This new highway access would coincide with existing rail access, making industrial development even more attractive.

Two new interchanges are proposed on existing NC 14-87, one of which would be located at the intersection of NC 14-87 and W. Kings Highway. This interchange would be in an urbanized area so it would impact access to businesses and Morehead Memorial Hospital. The other interchange at the intersection of NC 14-87 and Harrington Highway is located in a less developed area with some residences. The access to these residences would be impacted. It is also in the vicinity of a bicycle scenario project proposed along the Dan River so it may affect cyclist and pedestrian access. The proposed park and ride lots would be additional traffic generators, but would not have a large impact on accessibility.

*Macro Change in Accessibility* was ranked as medium-high because the proposed highway scenario projects would change the facilities' control of access, add new intersections and interchanges, construct roadways on new location, and provide new access to currently undeveloped land.

## ***Forecasted Population Growth***

*Ranking:* Medium Low

Population growth was forecasted for the CTP Study Area using data from the U.S. Census and Transportation Analysis Zones (TAZ). The annualized growth rate for the CTP Study Area including the City and unincorporated land in Rockingham County was determined to be 0.22 percent. This rate compares to the 0.21 percent annualized growth rate estimated by the Eden Thoroughfare Plan adopted by the City in 1996. Given this modest growth rate and the lack of large development projects, *Forecasted Population Growth* was ranked as a medium-low concern.

*References:* Eden Thoroughfare Plan (1996); Piedmont Triad Regional Council (2007); U.S. Census Bureau (1970-2000)

## ***Forecasted Employment Growth***

*Ranking:* Medium Low

The employment growth for the CTP Study Area is projected to increase from 8,240 jobs in 2007 to 10,854 jobs in 2035, calculated based off an initial growth ratio of 0.323 (2007 employment/population rates). Employment growth is anticipated for 2015 and 2025 at 8,830 and 9,822, respectively. Despite past decreases in employment due to industry closures, rates are expected to plateau before gradually rising to the 2035 projection. Manufacturing, retail trade, and health care/social assistance are the top employment industries in the CTP Study Area. With annual employment growth rates projected to be between zero and one percent for the CTP Study Area, the *Forecasted Employment Growth* was ranked as a medium-low concern.

*References:* Eden Thoroughfare Plan (1996); Piedmont Triad Regional Council (2007); U.S. Census Bureau (1970-2000)

## ***Available Land***

*Ranking:* Medium High

To evaluate Available Land, existing land use in the CTP Study Area, which includes Eden and unincorporated land in Rockingham County, was assessed. The total area is 41,800 acres. The unincorporated land is within Eden's Extraterritorial Jurisdiction (ETJ). The Rockingham County Land Use Plan, City of Eden Land Development Plan, zoning ordinances, and aerial photography were used in this qualitative assessment to estimate the amount of available land and regulations pertaining to it.

The City of Eden itself is nearly entirely developed with some opportunity for in-fill development. The City of Eden represents approximately 8,900 acres, or 21 percent of the CTP Study Area. For areas where in-fill development is likely to occur, the Eden Land Development Plan advises growth to be compact and urban. Specifically the plan encourages a connected road network,

mixed use development, the creation of activity centers instead of strip development, and cluster development where land is preserved as open space. Adopted in 2007 by the Eden City Council, these four principles support sustainable, compact growth and depend on inclusion in Eden's zoning ordinances.

Land outside of Eden's municipal limits is less developed and currently rural in nature. This region constitutes approximately 32,900 acres, or 79 percent of the CTP Study Area. Despite this representing a significant portion of the CTP Study Area with the potential for development, there are a number of growth management provisions guiding its development. The Eden Land Development Plan preserves this area's current land use through Rural Residential (RR) zoning. Under this designation, land is limited to one dwelling unit per acre and is outside city limits and public sewer. This zone effectively limits the development potential of this area for intense uses such as dense neighborhoods, strip malls, or factories.

The Rockingham County Land Use Plan also guides the development of this region. Similar to the Eden Land Development Plan, it seeks managed growth that brings prosperity while conserving the county's natural resources. To accomplish that vision, the Rockingham County Land Use Plan promotes alternatives to suburban sprawl that require less land. As for the unincorporated land within the CTP Study Area, the Rockingham County Land Use Plan classifies it as Urban Transition. Residential densities in this class may be up to 3 to 5 dwellings per acre. The Rockingham County Land Use Plan permits higher intensity development in this region than that of the Eden Plan. However, this region is within Eden's ETJ so development would likely reflect the stricter zoning in the city's land use/land development plan.

The total amount of available land was approximated to be 24,000 acres or 57 percent of the CTP Study Area according to estimates from aerial photography and the city and county land use plans. Although this amount of available land would typically be ranked as a high concern, *Available Land* was ranked as a medium-high concern given that the adopted land use plans encourage compact urban land use and preserve existing rural lands.

*References:* City of Eden Land Development Plan (2007); City of Eden Zoning Ordinance (2008); Rockingham County Land Use Plan (2005)

## ***Water and Sewer Availability***

*Ranking:* High

In the CTP Study Area, water and sewer service are provided by the City of Eden. In 2012, the city's total available water supply was 24.17 MGD and total demand 6.06 MGD (25 percent of supply). The total demand reflects Eden's water sales to Dan River Water, Inc. and Henry County, VA. The available water supply is anticipated to remain at 24.17 MGD during the planning horizon (2012 to 2060). During this same period, the total demand is projected to increase from 6.06 MGD in 2012 to 7.04 MGD in 2060, representing an annualized rate of 0.3 percent. This indicates a total increase of 16.2 percent. The City operates 170 miles of distribution lines currently. Dan River Water, Inc. has plans to extend water service outside of

the city. According to both capacity figures and the Eden Land Development Plan, there is an adequate water supply for the city currently and for future development.

The sewer system for the City of Eden consists of more than 161 miles of gravity and 19.4 miles of force main pipelines. The Mebane Bridge Wastewater Treatment Plant handles all wastewater for Eden and is permitted for 13.5 MGD. In 2012, its average annual daily discharge was 2.98 MGD. Future projections for wastewater were not available, but similar to projected water use, wastewater is not expected to increase substantially either. There are currently no plans to expand the wastewater treatment facilities. This capacity is adequate for existing and future development.

Rockingham County purchases water from the City of Reidsville and Town of Madison, and then distributes water to residents outside of these municipalities. Wastewater for these residents is treated by the City of Eden and the Town of Madison. These residents are not located in the CTP Study Area.

Given that water and sewer service is provided in 100 percent of the City of Eden and over 20 percent in Rockingham County, a high rank was given to *Water and Sewer Availability*. This ranking was also based on the large capacity for future water and sewer demand.

*References:* Eden Land Development Plan (2007), Water and Sewer Map (Page 33, 34); NC Center for Geographic Information and Analysis: Type A Future Public Water Systems (2006); NC Water, ncwater.org; Rockingham County Land Use Plan (2005)

## ***Market for Development***

*Ranking:* Medium Low

According to the U.S. Census, the populations of Eden and the CTP Study Area have remained relatively constant over the past few decades and are not expected to increase significantly. The CTP Study Area population is projected to grow only 0.22 percent per year. The number of households required by this growth was also projected from Transportation Analysis Zones (TAZ) data. Using historical persons per dwelling unit ratios, the number of households is forecasted to increase from 10,628 in 2007 to 12,169 in 2035, representing an annual growth rate of 0.49 percent. According to the Rockingham County Land Use Plan, there was a decline in new housing development from 2000 to 2005. Of the residential construction that has occurred, most has been in the southwestern part of the county, which is outside of the CTP Study Area. Out of the 60 major subdivisions built from 1995 to 2005, only one was in the CTP Study Area. The market for residential development is likely greatest where the NC 14-87 Bypass is proposed. There is available land in this area and water service is expected. There are currently some suburban neighborhoods interspersed in this primarily agricultural area.

The market for commercial or industrial development is currently low and not expected to increase substantially. The annual employment growth rate is projected to be between zero and one percent for the 2035 planning horizon. Commercial development would be expected at the new intersections and interchanges created by the CTP projects. Industrial development would

be expected along the West Draper Spur and Harrington Highway Eastern Extension since these two projects would increase access to available land in an area with existing industrial uses and necessary infrastructure. Given that minimal development is occurring and that the trend is expected to continue, *Market for Development* is ranked as a medium-low concern.

*References:* Rockingham County Land Use Plan (2005); Piedmont Triad Regional Council (2007); U.S. Census Bureau (1970-2000)

## ***Public Policy***

*Ranking:* Medium

The City of Eden presently adheres to moderate growth management policies employing two main policy tools: zoning and subdivision ordinances. Zoning ordinances for the City are the primary tool used to ensure land uses and densities are controlled while also providing access to adequate public services. The City currently operates under a *general use* type of zoning ordinance that corresponds with the existing city limits and the ETJ. Subdivision ordinances are used extensively in the City as a way to coordinate proposed and existing development, ensure adequate facilities and conditions for subdivisions, and protect the option to subdivide land. The City of Eden also has a flood damage prevention ordinance in effect that provides additional health and safety standards in flood prone areas.

The City aims to implement more stringent development policies as the area grows. Zoning ordinances and subdivision regulations are recommended to be used as they correspond to land use provisions and the ability to encourage future road construction and expansion. Key elements to manage growth for the future include:

- Protecting right-of-ways for future potential development and transportation improvements
- Expansion of the ETJ boundary to better control land development and streamlining zoning districts to allow for increased mixed-use development
- Preservation of open space, greenways, and riparian buffers
- Increased development of Planned Unit Developments (PUDs), mixed-use developments, and preservation of traditional neighborhood development
- Increased regional coordination with surrounding jurisdictions (Rockingham County) to ensure mutually supporting growth including transitional and conservation areas

Public Policy was given a medium ranking for the City and County's moderately stringent policies and regulations for development in the CTP Study Area. With existing zoning and subdivision ordinances, the City and County have dedication to growth management, but until more stringent regulations are enacted, the effectiveness of *Public Policy* is ranked as medium.

*References:* City of Eden Zoning Ordinance (2008); Rockingham County Land Use Plan (2005)

## ***Notable Environmental Features***

*Ranking:* Medium High

The CTP Study Area has an abundance of notable environmental features with more sensitivity including natural heritage areas officially designated as Registered Heritage Areas by the North Carolina Natural Heritage Program. Seven heritage areas are recognized, of which only two are officially registered and the remaining five are privately owned. The US Fish and Wildlife Service is the monitoring agency for wetland areas throughout Eden. The North Carolina Agricultural Extension Service has documented high-quality soil for farmland use and is an important natural feature in the City of Eden. The rivers and streams in the area are also of high quality and are not included in North Carolina's 303(d) list of impaired streams. Regionally, it is recognized that the Smith and Dan Rivers require water quality improvements due to historic industrial use of the water systems. Many of these environmental areas are also home to Federally Listed Threatened and Endangered Species.

Because of the relative abundance and sensitivity of natural environmental features, this category has been given a medium-high ranking.

*References:* Environmental Features Map; North Carolina Agricultural Extension; North Carolina Natural Heritage Program, <http://www.ncnhp.org/>

## **CTP-ICE Project-Level Screening: NC 14-87 Bypass**

### **NC 14-87 Bypass**

The NC 14-87 Bypass project, considered a “major improvement” in the highway scenario, was selected for an indirect effects screening. . The proposed bypass would be a two-lane facility on primarily new location from SR 1605 to NC 87-770. Its purpose would be to “increase capacity, improve safety, and relieve congestion on existing NC 14-87 as well as route traffic around the city’s primary business area” (Eden CTP, 2009). According to projections by NCDOT, the capacity of existing NC 14-87 would not be adequate to carry the projected 2035 daily volumes without this bypass.

The NC 14-87 Bypass was selected in particular for a CTP-ICE screening because it is a major project on primarily new location and because the Product 2 Future Growth Potential Assessment noted that there was a large amount of available land with future water service in the vicinity of the proposed bypass. These factors suggest that the bypass may induce growth along it and in doing so, may lead to more indirect effects. The CTP-ICE Project-Level Screening examines each of the factors included in the Plan-Level (entire CTP Study Area ) Screening, but at a finer scale in order to understand the indirect effects of the NC 14-87 Bypass specifically.

### ***CTP-ICE Project-Level Screening Results for NC 14-87 Bypass***

The CTP-ICE Plan-Level (entire CTP Study Area) screening resulted in *likely indirect effects* for the CTP Study Area whereas the Project-Level Screening for NC 14-87 Bypass resulted in *indirect effects expected* for the NC 14-87 Bypass. The factors contributing to the higher rating for the Project-Level screening were: scope of transportation plan investments, macro change in accessibility, available land, and market for development. These four factors were ranked as higher concerns because the proposed bypass would be a facility on primarily new location, the creation of new intersections, presence of available land, and greater market for development in the area.

## **CTP-ICE Screening Matrix for Indirect Effects, Project-Level: NC 14-87 Bypass (Local ID **YYYY####-#**)**

Product 3: CTP - ICE Screening Matrix for Indirect Effects, Project-Level: NC 14-87 Bypass, Local ID <b>XXXX####-#</b>										
Rating	Scope of Trans. Plan Investments	Macro Change in Accessibility	Forecasted Population Growth	Forecasted Employment Growth	Available Land	Water/Sewer Availability	Market for Development	Public Policy	Notable Environmental Features	Result
<b>More Concern</b>	High	High	> 3% annual population growth	> 3% increase New Jobs Expected	40% or greater of available land*	Services available (muni 100%, county 20% of area)	Development activity abundant	Less stringent, no growth management	Notable Feature(s): Abundant / More Sensitive	
High	X	X			X					Indirect Effects Expected
Medium-High						X	X		X	
Medium								X		
Medium-Low			X	X						
Low										
<b>Less Concern</b>	Low	None	No population growth or decline	No new Jobs or Job Losses	0 - 9% of available land*	Limited or no service available now or in future	Development activity lacking	More stringent, growth management	Notable Feature(s): Minimal / Less Sensitive	

\*Refer to Product 3 Procedure for rating descriptions

**Figure 2 – See attached matrix for larger image**

### ***Scope of Transportation Plan Investments***

*Ranking:* High

The proposed NC 14-87 Bypass is a significant investment as a facility on primarily new location. It would be expected to alter travel and land use patterns as a primary objective of the bypass is to “route traffic around the primary business area of the City of Eden” (Eden CTP, 2009). Routing traffic around Eden’s Central Business District could result in decreased business for downtown establishments.

The bypass is intended to serve as a major north-south route accommodating regional traffic between points south (Greensboro) and points to the north (Virginia). The proposed capacity of this facility is 13,000 vehicles per day (vpd), which is anticipated to alleviate congestion on existing NC 14-87 with a projected 2035 volume of 25,000 to 37,000 vpd. This would also impact travel patterns by reducing the travel time for those passing through Eden.

The *Scope of Transportation Investments* is ranked as a high concern because the proposed NC 14-87 Bypass is a significant investment as a facility on primarily new location with potential travel and land use impacts.

### ***Macro Change in Accessibility***

*Ranking:* High

As a facility on primarily new location, the proposed bypass would provide access to currently undeveloped land in Eden’s Extraterritorial Jurisdiction (ETJ). This access may encourage development, particularly at new intersections formed by the NC 14-87 Bypass with Rhodes Rd., Price Rd., and NC 770. Existing land use would likely change from rural and low-density residential to more intense residential and commercial use at intersections. Often commercial

development such as gas stations, fast food restaurants, and strip malls occurs at intersections where greater traffic can support such businesses.

*Macro Change in Accessibility* was ranked as high because the proposed bypass would provide access to currently undeveloped land and create new intersections.

## ***Forecasted Population Growth***

*Ranking:* Medium Low

Forecasted population growth for the region in the immediate vicinity of the NC 14-87 Bypass was not available. Therefore an annualized growth rate for the CTP Study Area was used in this analysis instead. Population growth was forecasted for the CTP Study Area using data from the U.S. Census and Transportation Analysis Zones (TAZ). The annualized growth rate for the CTP Study Area including the City and unincorporated land in Rockingham County was determined to be 0.22 percent. This rate compares to the 0.21 percent annualized growth rate estimated by the Eden Thoroughfare Plan adopted by the City in 1996. Given this modest growth rate and the lack of large development projects, *Forecasted Population Growth* was ranked as a medium-low concern.

*References:* Eden Thoroughfare Plan (1996); Piedmont Triad Regional Council (2007); U.S. Census Bureau (1970-2000)

## ***Forecasted Employment Growth***

*Ranking:* Medium Low

In order to forecast employment growth for the area immediately surrounding the proposed bypass, only the TAZs that would be crossed by the bypass were selected. Employment data was available at the TAZ level for 2007 and projected for 2035. The CTP estimated the number of 2035 jobs based on past employment trends in the region. In the five TAZs surrounding the proposed bypass there were 783 jobs in 2007. In 2035 there are projected to be 916 jobs.

The growth from 783 jobs in 2007 to 916 jobs in 2035 represents a 0.56 percent annualized growth rate. With annual employment growth rates projected to be between zero and one percent for the region around the proposed NC 14-87 Bypass, the *Forecasted Employment Growth* was ranked as a medium-low concern.

In comparison, the employment growth for the CTP Study Area is projected to increase from 8,240 jobs in 2007 to 10,854 jobs in 2035, calculated based off an initial growth ratio of 0.323 (2007 employment/population rates). The annual employment growth rates are projected to be between zero and one percent for the CTP Study Area.

*References:* Eden Thoroughfare Plan (1996); Piedmont Triad Regional Council (2007); U.S. Census Bureau (1970-2000)

## ***Available Land***

*Ranking:* High

Aerial photography was used to evaluate available land around the proposed bypass. The area immediately surrounding the proposed bypass is approximately 4,000 acres with an estimated 70 percent undeveloped. Most of the land is in agriculture use with the other predominant use being rural residential. All of this land is outside of Eden's municipal limits with some of it in Eden's Extraterritorial Jurisdiction (ETJ). The remaining portion of land is unincorporated within Rockingham County.

The Rockingham County Land Use Plan, City of Eden Land Development Plan, and current zoning ordinances guide how this land will be developed. The Eden Land Development Plan preserves this area's current land use through Rural Residential (RR) zoning. Under this designation, land is limited to one dwelling unit per acre and it is outside city limits and public sewer. Furthermore the plan focuses growth in Eden's downtown and built areas, away from rural lands. This rural residential zone effectively limits the development potential of this area for intense uses such as dense neighborhoods, strip malls, or factories.

The Rockingham County Land Use Plan also guides the development of this region. Similar to the Eden Land Development Plan, it seeks managed growth that brings prosperity while conserving the county's natural resources. To accomplish that vision, the Rockingham Plan promotes alternatives to suburban sprawl that require less land. As for the unincorporated land surrounding the proposed bypass, the Rockingham County Land Use Plan classifies it as Urban Transition. Residential densities in this class may be up to 3 to 5 dwellings per acre. The Rockingham County Land Use Plan permits higher intensity development in this region than that of the Eden Plan. However, this part of this region is within Eden's ETJ so development would likely reflect the stricter zoning in the city's land use/land development plan.

While both of these plans attempt to preserve rural character and limit development in the region surrounding the proposed bypass, the effectiveness of them depends on the city and county amending their zoning ordinances. To date, it does not appear that the existing ordinances are completely consistent with either of these plans. Therefore the development restrictions in this area are not stringent, and there is a high availability of land. The lack of stringent zoning ordinances in combination with aerial photography suggesting large portions of developable land resulted in a ranking of high concern for *Available Land*.

*References:* City of Eden Land Development Plan (2007); City of Eden Zoning Ordinance (2008); Rockingham County Land Use Plan (2005)

## ***Water and Sewer Availability***

*Ranking:* Medium High

In the CTP Study Area, water and sewer service are provided by the City of Eden. In 2012, the city's total available water supply was 24.17 MGD and total demand 6.06 MGD (25 percent of supply). The total demand reflects Eden's water sales to Dan River Water, Inc. and Henry

County, VA. The available water supply is anticipated to remain at 24.17 MGD during the planning horizon (2012 to 2060). During this same period, the total demand is projected to increase from 6.06 MGD in 2012 to 7.04 MGD in 2060, representing an annualized rate of 0.3 percent. This indicates a total increase of 16.2 percent. The City operates 170 miles of distribution lines currently. Dan River Water, Inc. has plans to extend water service outside of the city. This water extension would be in the vicinity of the proposed NC 14-87 Bypass, which would provide water to current residents and future development. According to both capacity figures and the Eden Land Development Plan, there is an adequate water supply for the city currently and for future development.

The sewer system for the City of Eden consists of more than 161 miles of gravity and 19.4 miles of force main pipelines. The Mebane Bridge Wastewater Treatment Plant handles all wastewater for Eden and is permitted for 13.5 MGD. In 2012, its average annual daily discharge was 2.98 MGD. Future projections for wastewater were not available, but similar to projected water use, wastewater is not expected to increase substantially either. There are currently no plans to expand the wastewater treatment facilities. The area around the proposed bypass would remain without sewer service. This capacity is adequate for existing and future development.

Based on availability of services for both the City of Eden and Rockingham County and an anticipated water extension, a medium-high rank was given for *Water and Sewer Availability*. A high rank would have been given if sewer service was expected around the proposed bypass.

*References:* Eden Land Development Plan (2007), Water and Sewer Map (Page 33, 34); NC Center for Geographic Information and Analysis: Type A Future Public Water Systems (2006); NC Water, ncwater.org; Rockingham County Land Use Plan (2005)

## ***Market for Development***

*Ranking:* Medium Low

According to the U.S. Census, the populations of Eden and the CTP Study Area have remained relatively constant over the past few decades and are not expected to increase significantly. The CTP Study Area population is projected to grow only 0.22 percent per year. The number of households required by this growth was also projected from Transportation Analysis Zones (TAZ) data. Using historical persons per dwelling unit ratios, the number of households is forecasted to increase from 10,628 in 2007 to 12,169 in 2035, representing an annual growth rate of 0.49 percent. Specific projections for the area surrounding the proposed bypass were not available.

According to the Rockingham County Land Use Plan, there was a decline in new housing development from 2000 to 2005. Of the residential construction that has occurred, most has been in the southwestern part of the county, which is outside of the CTP Study Area. Out of the 60 major subdivisions built from 1995 to 2005, only one was in the CTP Study Area. The market for residential development is likely greatest where the NC 14-87 Bypass is proposed. There is available land in this area and water service is expected. There are currently some suburban

neighborhoods interspersed in this primarily agricultural area. Commercial development would also be expected in this area, specifically at new intersections created by the bypass. Industrial development is not expected in this region because there are places within the CTP Study Area more attractive and better suited to industrial development by the West Draper Spur and Harrington Highway Eastern Extension.

Although minimal development has occurred in recent years, there is a market for development around the bypass given available land, available water, and new intersections. Therefore *Market for Development* is ranked as a medium-high concern.

*References:* Rockingham County Land Use Plan (2005); Piedmont Triad Regional Council (2007); U.S. Census Bureau (1970-2000)

## ***Public Policy***

*Ranking:* Medium

The City of Eden presently adheres to moderate growth management policies employing two main policy tools: zoning and subdivision ordinances. Zoning ordinances for the City are the primary tool used to ensure land uses and densities are controlled while also providing access to adequate public services. The City currently operates under a *general use* type of zoning ordinance that corresponds with the existing city limits and the ETJ. Subdivision ordinances are used extensively in the City as a way to coordinate proposed and existing development, ensure adequate facilities and conditions for subdivisions, and protect the option to subdivide land. The City also has a flood damage prevention ordinance in effect that provides additional health and safety standards in flood prone areas.

The land around the proposed bypass is classed as Rural Residential (RR) according to the Eden Land Development Plan (2007). This zone would limit residential development to one dwelling unit per acre. The Rockingham County Land Use Plan (2005) zones this region as Urban Transition allowing three to five dwelling units per acre. While both of these plans attempt to limit densities in this region, the effectiveness depends upon incorporating them into local zoning ordinances.

Public Policy was given a medium ranking for the City and County's moderately stringent policies and regulations for development in the CTP Study Area. With existing zoning and subdivision ordinances, the City and County have dedication to growth management, but until more stringent regulations are enacted, the effectiveness of *Public Policy* is ranked as medium.

*References:* City of Eden Zoning Ordinance (2008); Rockingham County Land Use Plan (2005)

## ***Notable Environmental Features***

*Ranking:* Medium High

The CTP Study Area has an abundance of notable environmental features with more sensitivity including natural heritage areas officially designated as Registered Heritage Areas by the North Carolina Natural Heritage Program. Seven heritage areas are recognized, of which only two are officially registered and the remaining five are privately owned. However, neither of these areas is located in the vicinity of the proposed NC 14-87 Bypass. The US Fish and Wildlife Service is the monitoring agency for wetland areas throughout Eden. Several wetlands are present near the bypass according to the National Wetland Inventory. The North Carolina Agricultural Extension Service has documented high-quality soil for farmland use and is an important natural feature in the City of Eden. The rivers and streams in the area are also of high quality and are not included in North Carolina's 303(d) list of impaired streams. Regionally, it is recognized that the Smith and Dan Rivers require water quality improvements due to historic industrial use of the water systems. Many of these environmental areas are also home to Federally Listed Threatened and Endangered Species.

Because of the relative abundance and sensitivity of natural environmental features, this category has been given a medium-high ranking.

*References:* Environmental Features Map; North Carolina Agricultural Extension; North Carolina Natural Heritage Program, <http://www.ncnhp.org/>; National Wetland Inventory