

Chapter 6: Summary

In 1944, the United States Congress issued a mandate to construct a “...scenic parkway to provide an appropriate view of Great Smoky Mountains National Park from the Tennessee side of the Park...” At that point in time, the Park had become a major tourist destination imbedded in a very rural setting in eastern Tennessee and western North Carolina. Access to the Park was via a relatively well developed but low capacity roadway network, and circulation within the Park was provided on a few even more problematic roads. Having an apparent vision of the future, Congress issued the stated mandate, which also carried with it the goals of providing improved access and circulation in the area surrounding the Park and reduced traffic congestion within its boundaries.

In the 57 years that have passed since the mandate was issued to construct what later came to be known as the Foothills Parkway, much has been done toward implementation of its requirements, but full completion of the project as outlined in the *Foothills Parkway Master Plan* remains a distant and increasingly elusive goal. In fact, so much has changed in the intervening years that significant questions are being raised as to the continued viability of the intended visitor experience and the extent to which other stated goals

can be achieved. There are also concerns about the very substantial development costs and constructability of the remaining sections due to impacts on the environment.

In realization of the passage of time and a radically changed Gateway area, this study was commissioned for the primary purpose of providing an in-depth assessment of the Foothills Parkway corridor in context with the Congressional mandate, the mission of Great Smoky Mountains National Park, the regional transportation network and the Gateway communities in Blount, Cocke and Sevier Counties. This assessment included evaluation of a variety of construction and alternative transportation development strategies in comparison to traffic impacts and environmental impacts, construction cost and visitor experience.

6.1 Year 2001 Conditions

Great Smoky Mountains National Park was established in 1926 for “the benefit and enjoyment of the people.” Park visitation has dramatically increased over the years, exceeding 10 million visitors in 2000. Not surprisingly, the once rural Gateway area of Blount, Sevier and Cocke Counties has responded through development of an extensive tourist service infrastructure. This metamorphosis has turned the

farmland of past decades into more than 15,000 motel rooms and overnight rental units, world class entertainment and recreation venues, expansive shopping districts, and a baseball stadium.

The year 2001 will apparently mark the first time that visitor activity in the Gateway area will increase while visitation to the Park will decrease, an indication that the Park and the Gateway area are now more equal partners in attracting visitors to the area. There are two aspects of the Gateway area development which are of concern to further Foothills Parkway development. Realizing that traffic volume has increased dramatically on the regional network, future traffic volume on the Parkway is of concern as it may negatively impact the visitor experience. In addition, continued development of the area between the Parkway and the Park may detract from the quality of the viewsheds, again negatively impacting visitor experience. Although land use in this area appears to be compatible with that envisioned in the *Foothills Parkway Master Plan*, the density of development is of increasing concern.

6.2 *Alternative Development Summary*

A variety of potential future development scenarios were reviewed as a part of this study. These included several roadway construction options, a no build option, and alternative transportation system options. The results of the evaluation of each option with reference to quality of viewsheds provided,

Parkway traffic volume projections, cost, Park road traffic relief and environmental impact is provided in Table 9 and described in the following paragraphs.

No Build Option

“No build” means to take no further construction action on Sections B, C, and D, thus this area of the Parkway right-of-way would remain undeveloped if retained by the National Park Service. As a result, no additional viewsheds would be available to the visitor, there would be no impact on traffic flow inside or outside the Park, and no impact on the environment. There is essentially no cost associated with the No Build option.

Full Build Option

Implementing this plan would include construction of the remaining 33.5 miles of roadway encompassing Sections B, C, and D. With the now pending completion of Sections E and F, the total 72.1-mile Parkway would be open to traffic.

The quality of viewshed score for this alternative (considering only Sections B, C, and D, not the total 72.1 miles) is 123.01 for Park views only and 160.67 for all viewsheds, the highest of the available options. Each individual section contributes to this score. Not surprisingly, this is in keeping with the statement in the *Foothills Parkway Master Plan* that the full Parkway must be completed in order to achieve “...full utilization of the parkway as a nationally significant scenic recreational resource...”

Table 9. Impact Assessment

SCENARIO	Quality of Viewsheds			Projected Year 2030 Parkway Traffic		Cost			Park Road Traffic Relief		Environmental
	Park		Total	Typ. Summer Weekday	Rating	\$ per mile	Total Annual O&M Cost (thousands)	Rating	Reduction	Rating	
	Score	Rating	Score	Rating							
No Build	0	-	0	0	"	0	0	+	0	-	+
Full Build (33.5 mi.)	123.01	++	160.67	4,400 - 10,300	"	\$7.5m	\$320	"	6,100 (Little River Rd.)	+	-
Build B (14.1 mi.)	86.89	++	85.37	4,400	+	\$7m	\$86	"	0	-	-
Build B Alternate (Pittman Center Proposal)	7.92	-	17.14	23,800	-	\$10m+	\$338	-	0	-	"
Build C (9.6 mi.)	24.41	+	35.4	7,800	-	\$5m	\$64	+	0	-	-
Build D (9.8 mi.)	11.71	+	39.9	10,300	-	\$10m	\$170	-	6,100 (Little River Rd.)	+	-
Build Transit:											
Rail	?		?	n/a	+	\$35m+	\$2,000 - \$3,500	--	n/a	-	-
Monorail	123.01	++	160.67	n/a	+	\$70m+	\$3,500 - \$4,500	--	n/a	-	-
	++ Very Good + Good			" Neutral						- Poor -- Very Poor	

Traffic analysis indicates a Year 2030 volume ranging from 4,400 vpd in Section B to 10,300 vpd in Section D. The Section B volume is consistent with a good visitor experience. The traffic volume on Sections C and D, however, are of concern in this respect. Should these sections be constructed, traffic conditions should be monitored and preparations made for some type of traffic management such as an Intelligent Transportation System (ITS) to control day to day volume to a level appropriate for good visitor experience. Analysis also indicates that completion of full Parkway construction will reduce traffic on Little River Road by an estimated 6,100 vpd in Year 2030. If, however, some type of traffic demand management is implemented on the Parkway, the benefit to Little River Road will likely be affected.

The projected development cost of this option is \$7.5M per mile or an approximate total of \$251M. This represents the highest construction cost of the roadway build options but is substantially less than rail development in the corridor.

Of the roadway build options, this one causes the greatest impact on the environment as it is cumulative. Based on current knowledge, environmental regulators believe all sections can be permitted and successfully completed, given proper attention to regulatory procedures and mitigation requirements. It is possible, however, that insurmountable environmental problems may come to light should development proceed.

Build Section B Roadway

Section B is 14.1 miles in length, extending from Cosby to Pittman Center. Evaluation indicates that it is the most scenic of the remaining three sections. The sectional preference value for Section B is 86.89 Park/85.37 total, substantially greater than the score of the other sections.

The projected Year 2030 traffic volume on Section B is 4,400 vpd, a level that should not negatively affect the visitor experience. Analysis indicates that Section B will reduce traffic on U.S. 321, but there appears to be no relationship between Section B and traffic on Park roads.

The estimated construction cost of Section B is \$7M per mile, not including the Webb Mountain recreation area. This is close to the average construction cost for the total roadway. While environmental impacts could be a challenge, based on current knowledge, this section can be permitted and completed.

Build Section B Alternate Roadway

This option was recommended by the Town of Pittman Center. It proposes to combine Foothills Parkway with U.S. 321 within the Section B corridor and to preserve it with access control to discourage future commercial development. Analysis indicates several concerns with this plan.

Existing U.S. 321 is in a valley and thus provides limited views of the Park. The calculated sectional preference value for Section B Alternate is 7.92 Park/17.14

total as opposed to 86.89 Park/ 85.37 total for the currently planned Section B. In addition, projected Year 2030 traffic is 23,800 vpd, thus requiring a multi-lane, higher design speed roadway. The cost of construction is estimated at \$10M per mile, considerably higher than for Section B, due to the wider typical section, the need for frontage roads and the requirement to purchase access control.

For these reasons, Section B Alternate does not appear to be better than or even a close equivalent to the currently planned Section B.

Build Section C Roadway

Section C is 9.6 miles in length, extending from Pittman Center to the Spur. The terrain in this area is not as steep as in other sections, which translates to a lower estimated construction cost of \$5M per mile. As previously noted, this cost does not include the cost of the interchange at either end of the section, those costs being included with the adjacent sections.

This section traverses a more developed area partially within the city limits of Gatlinburg, suggesting less impact on the environment; however, no formal environmental assessment has yet been undertaken. The sectional preference value is 24.41 Park/35.40 total, a substantial score although not the equivalent of Section B. Section C offers more and better views of the Park than Section D, but Section D offers a better total viewshed score.

Section C, if built without the adjacent sections, is projected to carry a Year 2030 traffic volume on 7,600 vpd. This traffic volume will likely be a detriment to visitor experience, and consequently, this section of the Parkway should be considered a candidate for traffic management as described above.

Section C construction has a positive effect on traffic congestion on adjacent and intersecting network roadways but no definable relationship to roadways within the Park.

Build Section D Roadway

Section D is 9.8 miles in length, extending from the Spur to U.S. 321 in Wears Valley. Due to the steep terrain and geologic features, this section is the most problematic to construct.

Construction challenges, due in part to the need for a tunnel, are significant, the \$10M per mile cost is high in comparison to other sections, and the environmental impacts are the most severe.

The section provides a rather modest 11.71 viewshed quality score for Park views only but a more substantial total preference value, 39.90, and is projected to carry a Year 2030 traffic volume of 10,300 vpd. Again, traffic management as previously discussed may also be required on this section.

Coupled with Sections E/F, Section D produces the most positive effect on the regional roadway network and also is projected to reduce traffic on Little River Road within the Park by 6,100 vpd in Year 2030.

Build Rail Transit

Under this option, either traditional or light rail would be built in the available right-of-way of the Parkway rather than the currently planned roadway. Given the more rigid design and operational requirements for rail, construction in this corridor is extremely difficult and expensive, estimated at \$35M per mile.

There are no advantages of rail construction versus roadway construction relative to environmental impact. Detailed evaluation of viewsheds would require a functional design; excessive cuts associated with the need for flatter slopes, however, suggest that the number and quality of viewsheds would be less than the roadway alternatives.

Build Monorail Transit

With proper design attention to elevations and the minimization of cuts, a monorail transit system in the corridor would provide a superior visitor experience in terms of providing views into the Park. Unfortunately, the cost of construction even in more favorable terrain exceeds \$70M per mile. This excessive construction cost renders the option infeasible.

Exclusive Rubber Tired Transit

Chapter 4 provides an evaluation of rubber tired transit as an option to currently proposed roadway construction. This approach does not appear to be feasible or cost effective as an alternate, because a roadway of the same basic construction standards as currently proposed would be required for rubber tired transit operation.

Should the Parkway be completed and opened to general non-commercial traffic, the addition of rubber tired transit as a modal choice is considered to be especially viable. Recent and current Gateway area studies have indicated that transit must become an integral part of the mobility solution, and the Parkway should certainly be included in future planning. In fact, if traffic demand management techniques are implemented, a rubber tired transit system might well meet the need of those who otherwise would be denied access due to traffic densities reaching the specified threshold.

Trails

Trail development is not considered a viable alternative to roadway construction in meeting the 1944 vision. Trail development within the corridor, however, should be seriously considered as Parkway planning continues.

Trail development may take two forms:

- As a co-use with a roadway on currently opened sections and on sections constructed in the future. It is believed that the corridor is wide enough to accommodate both in some fashion.
- As a primary use on any section where roadway construction is not completed.

Considerable research and discussion is currently underway within the National Park Service, the Federal Highway Administration, and other organizations on the relationship of trails, especially bike trails, to roadways in recreational

settings. Future trails planning for Foothills Parkway should be accomplished in light of then current policy.

6.3 Level of Visitor Experience

The level of visitor experience along the Foothills Parkway depends primarily on the number and quality of Park views available to visitors and the traffic density they will encounter as they attempt to enjoy those views. To be successful, the Foothills Parkway must attract visitors, but if too many visitors use it, the congestion will likely detract from the visitor experience.

6.3.1 Visitor Use

Foothills Parkway Sections B, C, and D are all expected to attract a substantial number of visitors. Some will be exclusively commuters traveling from one off-Parkway location to another. Others will have the opposite objective of viewing the Park and enjoying the recreational opportunities provided by the Foothills Parkway. These visitors are making destination trips to the Foothills Parkway. Finally, many will have the dual purpose of using the Foothills Parkway to travel from one off-Parkway location to another and along the way enjoying the Parkway for its views of the Park and its recreational value.

Additional studies will be necessary to better quantify what traffic density will detract from the visitor experience, but an order of magnitude of 10 to 15 vehicles in a half-mile segment of road seems reasonable. This traffic density will most likely occur during summer weekday peak hours when the daily

traffic volume is about 4,500 vpd. Section B is expected to attract approximately 4,400 vpd in Year 2030, and this magnitude is not expected to result in a traffic density that will significantly detract from the visitor experience. Sections C and D are expected to attract about 9,500 and 10,300 vpd, respectively, which should result in traffic densities at times that do detract from the visitor experience.

6.3.2 Visitor Experience

Using the procedures discussed in Chapter 2, Viewshed Analysis, a total of 32 locations were identified along the Foothills Parkway where views of the Park are available; an additional 11 locations offer views of the Foothills area but no Park lands. Section B provides 22 viewsheds, all of which include Park lands; Section C provides 10 viewsheds, seven (7) of which include Park lands; and Section D provides 11 viewsheds, three (3) of which include Park lands. Not only are there a significant number of views of the Park, but the views are generally of high quality as evidenced by good viewshed preference values. As noted, some viewsheds, though picturesque, do not include the Park and therefore do not technically meet the mandate requirement, thus separate analysis and scores are provided.

For each viewshed designation within each Foothills Parkway section, all of the viewshed preference values were averaged, and then those values were aggregated into section viewshed scores. The sectional preference values for Section B are substantially greater than for Sections C and D. These two

latter sections provide fewer views of the Park and slightly lower viewshed preference values than Section B. In summary, the viewsheds in Section B were rated “very good”, whereas in Sections C and D, they were rated as “good”.

6.3.3 Traffic Density

Section B has the highest sectional preference value and projected daily traffic volumes below the magnitude which would significantly detract from the visitor experience. The overall visitor experience would be rated “very good.” Sections C and D have lower viewshed scores and Year 2030 traffic volumes that probably will detract from the visitor experience during peak hours of typical summer weekdays. Some traffic management techniques may be required to restrict access to the Foothills Parkway during the hours of highest demand. Nevertheless, the level of visitor experience would be considered “good” for Sections C and D and could be improved with traffic management techniques.

6.4 Issues For Future Evaluation

During the course of the study, several issues presented themselves that suggest the need for additional consideration or evaluation in the future. Some relate to more detailed evaluation of implementation options and others are pertinent only after a final implementation decision has been made.

The first category includes:

- 1) Evaluation of traffic density impact

- on the level of visitor experience,
- 2) Updating the Gateway area traffic model, and
- 3) Evaluation of impact of uphill development on visitor experience.

Three additional items fall into the latter category:

- 4) The need for demand management,
- 5) The use of rubber tired transit, and
- 6) Potential trail development.

The following paragraphs provide a more detailed description of these issues.

6.4.1 Traffic Density Impact on Level of Visitor Experience

Section 3.5 notes that the typical procedure for evaluating operating conditions on a two-lane highway, as outlined in the *Highway Capacity Manual*, is not applicable when the primary use is for recreational traffic. Moderate to high volume to capacity ratios are acceptable under typical high design speed highway operating conditions, but the careful and constant attention of drivers is required. This condition would translate to a density of perhaps 45 vehicles per half mile, 25% of the roadway occupied, or 12,000 vpd (midrange Level of Service D values).

In recreational driving, however, a reasonable percentage of driver attention is desirably directed to the scenery. A density on the order of that described above will clearly not allow what could be more typically described as “driver inattention”.

The results of this study suggest that a density of up to 10 to 15 vehicles per

half-mile of roadway would provide a suitable environment for recreational driving. This translates to about 5% of the roadway being occupied or roughly 4,500 vpd. This conclusion, however, is based primarily on the experiences of the evaluation team and observations of traffic on Little River Road and Newfound Gap Road, two other recreational routes within the Park.

Intuitively, as the density of traffic on recreational routes increases, the level of negative impact on visitor experience increases as well. The intuitive conclusion that visitor experience is not materially impacted when the density of traffic is less than 15 vehicles per half mile is subject to further research and analysis. Likewise, the incremental impact of traffic density on the quality of the visitor experience is a worthy subject for further research.

6.4.2 Traffic Model Update

Chapter 3 also describes the use of the *Sevier County Long Range Transportation Plan* traffic model as a primary evaluation tool in this study. As noted, there are several limitations:

- The model is somewhat dated in that it was based on 1994 land use and traffic data;
- The model produced traffic projections for 2004, a much shorter horizon period than used in this study; and
- The model included only the Sevier County roadway system. Specifically, it did not include either Cocke County or Blount County roads that are affected

by the Parkway nor did it include all such roads within the Park itself.

The evaluation team developed a procedure to expand the model to include the additional roadways and is convinced that the resulting analysis is sound. Given the need for projections to Year 2030, however, an update of this model using more current data and an expanded geographic base is encouraged.

6.4.3 Impact of Uphill Development

Much concern has been expressed over several decades about the effect of residential and commercial development on the Parkway viewsheds. The 1968 *Foothills Parkway Master Plan* notes that "...Without adequate protection, the character of the corridor through which the scenic parkway passes in time may be altered and lose some of its recreation and scenic value..." and suggests cooperation with local government in developing scenic control through zoning.

In fact, little has been done in this regard, and development of the Gateway area over the years has included a considerable number of structures within the viewsheds. Land use in the area between the Parkway and the Park is generally consistent with that envisioned in the *Foothills Parkway Master Plan*, but development density in some areas is significant; so much so, in fact, that some have questioned the viability of achieving the 1944 vision of the Parkway being a "special place."

Conversely, the SMS 18 research has

indicated that the public does not necessarily consider development within the viewshed as being particularly objectionable. In fact, viewsheds which included modern structures were given medium to high approval ratings in that study. Interestingly, this question was posed in the questionnaire for the second round of Parkway public meetings with the result being: detrimental—38%, not detrimental—55%, and 7% no response.

It appears that most, if not all, of the Blue Ridge viewsheds that included development, however, were in a downhill environment, i.e., the view was from above looking down into a valley. In the Parkway situation, however, a majority of the views will be uphill with the structures being in the foreground of more distant mountain vistas. This situation suggests further consideration and possible action. First, additional research is suggested to confirm the extent to which uphill development is considered objectionable to the viewer. Second and perhaps dependent on the result of the first, discussion of scenic control zoning and/or easements may need to be initiated with appropriate Gateway communities.

6.4.4 Need For Demand Management

Long range traffic projections for Sections C, D, E, and F suggest a density of traffic that will clearly be a detriment to the quality of the visitor experience. Sections E and F, which are scheduled for completion in the relatively near future, are especially problematic in this respect.

It appears that maintaining a good visitor experience for decades into the future will require some form of demand management. An evaluation of Intelligent Transportation System alternatives is recommended.

6.5 Conclusion

Approximately 22.5 miles of the 72.1-mile Foothills Parkway envisioned by Congress in 1944 are now open to traffic; 16.1 miles are partially constructed and 33.5 miles (Sections B, C and D) require further commitment. Based on current information, construction of these three sections appears feasible, although further evaluation of environmental impacts and the cost of construction is required.

Analysis indicates that completion of all sections of the 72.1-mile Parkway will best achieve the Congressional mandate and its associated goals. More specifically, all sections offer opportunities to view the Park and the surrounding foothills area and consequently have the potential to provide a pleasant driving experience. The visitor experience may potentially be impacted over time by excessive traffic on certain sections, thus monitoring is recommended along with implementation of demand management if needed. A completed Parkway will also provide improved connections to the regional roadway network and will reduce traffic on several existing roadway sections within and outside the Park.

The study also reviewed alternatives to roadway construction within the corridor

that would provide mobility and a pleasant visitor experience. None of these alternatives, which included trail development and several types of mass transit, were found to be cost effective and/or able to meet the mandate requirements. Should the Parkway be completed and opened to general non-commercial traffic however, the addition of rubber tired transit as a modal choice is considered to be very desirable.

Based on input received from the public through interviews and public meetings, a solid majority of respondents favor full completion of the Parkway. An overwhelming majority also desire options to the personal vehicle in providing the visitor experience. Finally, should any section not be constructed, public sentiment suggests that the National Park Service retain the right-of-way for Park use.