

# THE RESTORATIVE EFFECTS OF ROADSIDE VEGETATION

## Implications for Automobile Driver Anger and Frustration

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**ABSTRACT:** Anger and frustration may contribute to unsafe driving and may trigger instances of aggressive driving or road rage. Research shows that stress, fatigue from the exercise of directed attention, or a combination of these factors can exacerbate anger and frustration. It also suggests that exposure to vegetation can facilitate recovery from stress and fatigue. Can highway vegetation mitigate automobile driver anger and frustration? We assigned 106 participants at random to view one of three videotapes of highway drives, which varied in the amount of vegetation versus man-made material. The experiment obtained Spielberger State-Trait Anger Expression Inventory (STAXI) measures of anger before and after video exposure and obtained a measure of frustration tolerance after the video. No significant effect on anger emerged, but the results for frustration tolerance showed higher frustration tolerance (respondents spent more time on unsolvable anagrams) after exposure to videotapes with more vegetation. Parkway design and roadside vegetation appear to have restorative effects in reducing frustration.

**Keywords:** *stress; frustration; attention fatigue; restorative experience; highway design; parkway*

**In a National Highway Traffic Safety Administration (NHTSA) survey,** more than 60% of the participants reported that unsafe driving actions were

ENVIRONMENT AND BEHAVIOR, Vol. 35 No. 6, November 2003 736-751

DOI: 10.1177/0013916503256267

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major threats to themselves and their families, and one third thought that driving had become more dangerous than a year ago (NHTSA, 1999). In a statement to a House subcommittee on surface transportation, Dr. Martinez, NHTSA Administrator, described aggressive driving as “driving behavior that endangers or is likely to endanger people and property” (NHTSA, 1997, Aggressive Driving section, para. 2), and noted a lack of responsible driving behavior and increased congestion as causes. He reported that the number of drivers and miles driven had increased faster than new roads thereby leading to increased traffic congestion, driver stress, and frustration. “When driver expectations are unmet,” he said, “anger and aggression can be unleashed” (NHTSA, 1997, Increased Congestion & Travel section, para. 2).

Automobile drivers experience stress from life events, commuting, and visual clutter (Ewald & Mandelker, 1977; Hennessy & Wiesenthal, 1997; Novaco, Stokols, & Milanese, 1990; Selzer & Vinokur, 1974). People experiencing life-event stress are more prone to traffic accidents (Selzer & Vinokur, 1974), and stress from driving can affect job performance and satisfaction (Novaco et al., 1990). Congestion and impedance increase driver stress and have negative effects on mood and behavior (Novaco et al., 1990; Stokols, Novaco, Stokols, & Campbell, 1978). Research implicates driver stress as a factor in driver frustration and aggression (Gulian, Matthews, Glendon, Davies, & Debney, 1989; Hennessy & Wiesenthal, 1997). Perhaps some of these effects relate to fatigue from directed attention (cf. Hartig & Evans, 1993). Symptoms of directed attention fatigue include impatience, distractibility, impulsivity, and irritability. Stress and directed attention fatigue most likely interact to decrease functioning (Kaplan, 1995). Anger while driving may also change depth perception, impair judgment, and cause physical fatigue (Battaile, 1999).

In some cases, driver stress or fatigue may lead to finger-pointing, name-calling, or may even tragically escalate to violence and death (Johnson, 1997; MPT Online, 2000). Aggressive driving—or its criminal cousin, road rage—exact a toll on many drivers both as the outward expression of a physiologically harmful stressor and by predisposing drivers to engage in unsafe actions (Gulian et al., 1989; NHTSA, 1997).

Early writers touted nature as an antidote to stress and wrote of the value of scenic parkways. More than 100 years ago in 1865, Fredrick Law Olmsted (1990), landscape architect and parkway advocate, wrote:

It is a scientific fact that the occasional contemplation of natural scenes of an impressive character . . . is favorable to the health and vigor of men . . . the reinvigoration which results from such scenes is readily comprehended. (p. 502)

Research shows that people prefer scenes with vegetation to scenes with man-made structures (Kaplan & Kaplan, 1989; Kaplan, Kaplan, & Wendt, 1972; Nasar, 1998). For urban scenes, preference increases with the amount of nature (Nasar, 1988; Talbot, 1988). The preference for nature also applies to roadways. People prefer less developed and more scenic routes (Evans & Wood, 1980; Ulrich, 1973). Vegetation can also improve mood, reduce stress, and facilitate recovery from directed attention fatigue. Scenes with vegetation produce greater positive feelings than urban scenes (Ulrich, 1979). Exposure to vegetation produces beneficial mood changes and tension relief (Knopf, 1987); even short exposures in urban parks boost feelings of calmness and energy (Hull, 1992). Nearby nature and gardening activities provide emotional and social benefits (Kaplan & Kaplan, 1989; Kuo & Sullivan, 1998). Preferences for natural scenery over urban scenery and for urban scenery with vegetation relate to positive mood changes and physiological measurements that indicate stress reduction (Ulrich et al., 1991). A view of vegetation through a window, through slides, or even in a scenic poster all produce positive psychological effects, and the presence of windows appears to increase healing (Pitt & Zube, 1987; Ulrich et al., 1991). Exposure to nature can increase directed attention (Hartwig & Evans, 1993), even when mood is unchanged (Kaplan, 1995). Environments supporting the restoration of directed attention include a sense of being away, *soft* fascination, and extent (or enough richness and coherence to feel like a "whole other world") and compatibility with "one's purposes and inclinations"—all of which many natural environments offer (Kaplan, 1995, p. 173).

One study looked at the restorative effect of roadside scenery on automobile drivers. Psychophysiological measures showed that the participants had a greater stress recovery and less anger, aggression, and fear when exposed to vegetated versus urban roadside videos (Parsons, Tassinary, Ulrich, Hebl, & Grossman-Alexander, 1998). Our study tests parkway design versus the traditional highway in its effect on anger and frustration, and, within traditional highways, it tests effects of variations in the ratio of built-up to natural material alongside the road. The tests were conducted in relation to simulated, light traffic conditions. We realize that congestion and other drivers cutting in and out may overpower any salutary effects from the scenic parkway designs, but we chose the light traffic conditions to see if any initial effect emerged. We used the simulated drives for control and practicality. Creating dynamic simulations which would give the driver the ability to control the speed and movement of the car would have required more resources and time than we had available. If effects emerged, the results would suggest the need for tests in more realistic conditions and with heavier traffic, but they might also

suggest that even in heavy traffic, highways designed with a lot of vegetation might allow drivers to find relief from the traffic through glimpses of vegetation and through the experience of it in their peripheral vision.

## METHOD

### STIMULI

Three videotapes served as stimuli. Each tape was 4 minutes and 45 seconds long and was cut from videos taken within eight miles of each other on northern New Jersey or southern New York highways (Figures 1 through 3). One video, labeled *Scenic Parkway*, depicts a drive along the Palisades Parkway in New York immediately north of the New Jersey line. Designed as a parkway in the 1940s (NYCROADS, 1999), it has two lanes, no asphalt shoulders, an average right-of-way of 122 meters with a median of vegetation and trees, and heavy roadside vegetation blocking views to built structures. Though this road had fewer lanes, narrower lanes (3.7 m), and more curves and grade changes than the two highway conditions, we used it to allow a comparison of the parkway design (which has these features) to the more typical highway design.

The other videos show two controlled access highways, each with six lanes of traffic and opposing traffic separated by a concrete barrier. One video, labeled *Built-Up Highway* (State Route 17 through Paramus, New Jersey) has strip malls, commercial signs, telephone poles, and some vegetation along the road.

The other video, labeled *Garden Highway* (Garden State Parkway, which crosses Route 17), has parkway elements in addition to the highway design. It has few signs or telephone poles visible, and trees screen most man-made structures and the surrounding environment.

Independent judging by four observers produced unanimous agreement that the relative amount of vegetation and spatial edges provided by trees increased from *Built-Up Highway* to *Scenic Parkway*. The judges also concurred that visual clutter, the prominence of man-made structures, and intrusive signs decreased from *Built-Up Highway* to *Garden Highway* to *Scenic Parkway*.

We filmed all videos through the front windshield in the same weather conditions at a speed between 50 and 55 mph. Because research shows that higher traffic congestion and impedance increase driver stress (Appleyard, 1981; Hennessy & Wiesenthal, 1997; Novaco et al., 1990; Stokols et al.,



Figure 1: A View From *Built-Up Highway*

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Figure 2: A View From *Garden Highway*

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1978), we kept traffic at a light to moderate level; for the drives in naturalistic conditions, however, we could not match the levels of traffic in each drive. As a next best alternative, we opted for an approach conservative to our hypotheses—higher traffic levels for the videos where we expected the greatest stress recovery.<sup>1</sup> Though this choice may have reduced the effect of the parkway and vegetation along the highway, if an effect emerged, it would more likely represent a strong one because it overcame the increased stress from higher



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**Figure 3: A View From *Scenic Parkway***

traffic. The higher traffic level, however, may have eliminated effects that would have appeared had we been able to control the traffic levels in the three conditions.

#### **PARTICIPANTS**

A total of 106 students (67 males and 39 females) participated. The sample (Table 1) had more males than females and an average age of 25.3 years. None of the participant characteristics differed significantly across videotapes.

Participants came from classes in City and Regional Planning and Landscape Architecture at The Ohio State University. With the exception of nine participants who volunteered, the students participated as part of course requirements. We tested up to three participants at a time. The experimenter used a random number table to assign the video to each group. Participants were briefed, and they signed a consent form.

#### **PROCEDURE**

Participants sat in a plain office at a common table facing a 51-centimeter television placed 0.5 meters from the table. Partitions separated participants, so they could not see one another's actions. We had one audiotape player on the table and one on a desk behind the participants.

Participants were told not to talk during the experiment. Prior to the test, we had each put his or her right foot on a dummy accelerator (block of wood)

**TABLE 1**  
**Group Characteristics by Video**

	<i>Built-Up Highway</i> n = 35	<i>Garden Highway</i> n = 34	<i>Scenic Parkway</i> n = 37
Gender			
Males	57.1%	52.9%	78.4%
Females	42.9%	47.1%	21.6%
Group size			
One	17.1%	20.6%	8.1%
Two	40.0%	52.9%	43.2%
Three	42.9%	26.5%	48.6%
Major			
Design	65.7%	67.6%	83.8%
Other	34.3%	32.4%	16.2%
Year in School			
Freshman/sophomore	40.1%	29.8%	27.8%
Junior/senior	14.3%	32.3%	47.2%
Grad student	45.7%	37.2%	25.1%
Age			
Mean years ( <i>SD</i> )	24.7 (5.7)	26.8 (7.2)	24.6 (5.6)

and started a foreign video. We told them they would be questioned later about the contents of the video. Under the guise of needing a baseline concentration level, we gave them a 10-minute prestressor. The table audiotape played a tape with four sets of 25 pairs of numbers for them to add mentally with most pairs requiring a carry. Respondents had 3 seconds to write their answer for each number pair. Because exposure to random and uncontrollable noise stresses people performing tasks (Glass & Singer, 1972; Wohlwill, Nasar, DeJoy, & Foruzani, 1976), we added random, intermittent noise during the test. The noise tape had a mix of a Spanish language tape, modern classical music, and noises (including a whistle and metallic bangs). It started at a normal listening volume, but, halfway through the test, the volume increased. After the test, participants were to write what they had noticed about the video and to score their own math tests. To heighten stress, we told participants that we only needed to score 10 questions. We gave them a false scoring key, which had 5 of the 10 questions scored wrong: Most participants scored a 1 or 0.

The participants then took the State Anger section of the Spielberger State-Trait Anger Expression Inventory (STAXI). It has 10 four-point items measuring "the intensity of angry feelings at a particular time" (Spielberger, 1996, p. 1; see also Fuqua et al., 1991). The STAXI test, used in more than 40 studies with normative data compiled from more than 9,000 individuals

(Speilberger, 1996), shows good validity and reliability (Raphael, 1998; Speilberger, 1996). After the anger test, the experimenter told participants they would see a roadside video. They were asked to focus on the screen, place their foot on a dummy accelerator, and imagine they were driving to work. After viewing the video, the participants were told they had reached the office and could remove their foot from the dummy accelerator. They then completed the STAXI again.

Next, they were told their boss wanted them to do a concentration task—a set of four word puzzles. These anagrams, or scrambled words, were IUFTR (FRUIT), ANBIT, DATGI, and OEWRP (POWER). The participants were told to unscramble the letters to form a single English word using all of the letters and not to write anything on the paper but the final answer. We did not tell them that the second and third anagrams were unsolvable. They each received a stopwatch. When they were ready, the experimenter handed them the first anagram. The participants stopped the stopwatch when they solved an anagram or when they determined they could not solve it. They received no time limit, but participants who persisted 5 minutes were told to move on to the next anagram. After each participant stopped the stopwatch, the experimenter recorded the time and handed the participant another anagram. Participants who finished the test waited and read test-debrief material until everyone finished. The procedures follow those used by DeJoy (1985) in his study of frustration tolerance after noise exposure. He found the time spent on the unsolvable anagrams related to the type of noise exposure. Participants received a full debriefing and a written summary of the experiment.

## RESULTS FOR ANGER

STAXI State Anger scores can range from 10 to 40. The analysis only included respondents who reported some anger—a score greater than 12—after the stressor and before viewing the roadside video. The resulting sample ( $n = 78$ ) had a mean State Anger score of 19.08 ( $SD = 5.42$ ) before the videos. That mean score dropped to 11.86 ( $SD = 2.86$ ) after the videos. The second score (1.86 above the absolute minimum possible for anger) indicated a bottom effect, confirmed in the mean postvideo State Anger scores for each condition (*Scenic Parkway*: postvideo = 12.083,  $SD = 2.796$ ; *Garden Highway*: postvideo = 11.385,  $SD = 2.684$ ; *Built-Up Highway*: postvideo = 12.107,  $SD = 3.131$ ). The bottom effect ruled out a meaningful test of changes in anger across the three roadside conditions (*Scenic Parkway*, *Garden Highway*, and *Built-Up Highway*). With relatively low prevideo anger scores and

postvideo anger scores dropping to the lowest score possible, the anger measure lacked the room to differentiate between the three roadside conditions. The analysis confirmed this problem. It showed no statistically significant difference on the change in anger across the experimental conditions. (Subsequent analysis of the full sample yielded the same results).

### RESULTS FOR FRUSTRATION TOLERANCE (ANAGRAMS)

For the anagrams, the time spent on the unsolvable anagrams served as a measure of frustration. Frustration should lead people to quit the unsolvable anagrams more quickly. We conducted a repeated measures analysis of covariance with the video as a between-group measure, the anagrams (solvable, unsolvable) and trials (first and second trial) as within-group measures, and the group size as a covariant. (Six cases were dropped from the analysis because of missing data). We used group size as a covariant, because it varied across the videos and because preliminary analysis suggested that time spent on the anagrams varied with group size,  $F(2, 97) = 6.66, p < .01$ . The average time for each unsolvable anagram increased with group size. For the first unsolvable anagram, time increased from 87.3 to 106.7 to 148.9 seconds as group size increased from 1 to 2 to 3 persons ( $SDs = 48.9, 79.1, \text{ and } 74.2$ , respectively). For the second unsolvable anagram, time increased from 91.5 to 120.7 to 150.7 seconds as group size increased from 1 to 2 to 3 persons ( $SDs = 49.5, 73.2, \text{ and } 68.0$ , respectively). Solvability  $\times$  Group Size achieved marginal statistical significance,  $F(2, 97) = 2.40, p = .10$ . The differences in time spent on the unsolvable anagrams may have arisen from social conditions. Although partitions separated respondents, respondents had to signal the experimenter when they wanted to move to the next anagram. Because the experimenter gave the next anagram to the respondent, a lack of movement from the experimenter could have suggested to them that the other respondents were still working on their anagrams. With another person or with two other people still working, a respondent might feel inhibited to give up. A lone respondent would not feel this additional impetus to continue. (We did not include gender, major, or age in the model because preliminary tests found no statistically significant main or interactive effects of those variables with solvability).

The analysis of covariance (with group size as a covariant, video as a between-group factor, and solvability as a within-group factor) yielded statistically significant effects for solvability ( $F[1, 96] = 4.77, p < .05$ ), group

size ( $F[1, 96] = 10.59, p < .01$ ), and Solvability  $\times$  Video ( $F[2, 96] = 3.60, p < .05$ ). Subsequent tests adding gender and major as covariants did not change the effects found. The solvability effect resulted from the expected situation where respondents spent less time on each solvable anagram (35.7 s and 34.8 s,  $SDs = 50.1$  and  $51.0$ ) than on each unsolvable one (120.6 s and 127.9 s,  $SDs = 76.6$  and  $70.5$ ). As reported earlier, the group size effect resulted from increases in time spent on the unsolvable anagrams as group size increased. The Solvability  $\times$  Video effect reflects the hypothesized difference in time spent on the unsolvable versus solvable anagrams across the video conditions. Figure 4 shows the mean time spent on each solvable and unsolvable anagram across the three videos. The *Built-Up Highway* respondents spent more time than the other groups on the solvable anagrams (40.7 and 38.1 s vs. 37.4 and 29.6 s for *Garden Highway* and 29.3 and 36.3 s for *Scenic Parkway*,  $SDs = 68.7, 63.9, 41.1, 34.5, 34.6,$  and  $50.1$ , respectively), and the difference in time between the solvable and unsolvable anagrams was highest for *Scenic Parkway*. *Scenic Parkway* respondents spent a total of 231.2 seconds more on the unsolvable anagrams than on the solvable ones as compared to a total of 146.1 seconds more for *Garden Highway* and 152.1 seconds more for *Built-Up Highway*. We also analyzed results for the solvable and unsolvable anagrams separately. Analysis of covariance for the unsolvable anagrams alone (with group size as a covariant) revealed a marginally significant effect of videos ( $p = .07$ ); however, adding gender and major (which appear to differ for the *Scenic Parkway* condition) as covariants yielded a statistically significant effect of the videos on the unsolvable anagrams,  $F(2, 96) = 3.46, p < .05$ . Similar analyses for the solvable anagrams alone revealed no significant differences. Comparisons across each pair of videos (with group size, gender, and major as covariants) revealed the same pattern of effects. *Scenic Parkway* participants spent significantly more time on the unsolvable anagrams than did *Garden Highway*,  $F(1, 65) = 4.84, p < .05$ , or *Built-Up Highway* participants,  $F(1, 67) = 5.66, p < .05$ . Tests with group size alone as a covariant produced similar effects. In sum, *Scenic Parkway* respondents exhibited less frustration than did the others.

Because some individuals may have written down answers to the unsolvable anagrams thinking they had solved them, we redid the analysis to only include those trials where the participants had given up on the unsolvable anagram without writing down any answers. These analyses, which reduced the sample size to as low as 67 and 77 participants for the unsolvable anagrams, showed a similar pattern of results—a statistically significant Solvability  $\times$  Video effect ( $p < .05$ ) showing that the difference in time between solvable and unsolvable anagrams increased from *Built-Up Highway* and *Garden Highway* to *Scenic Parkway*.

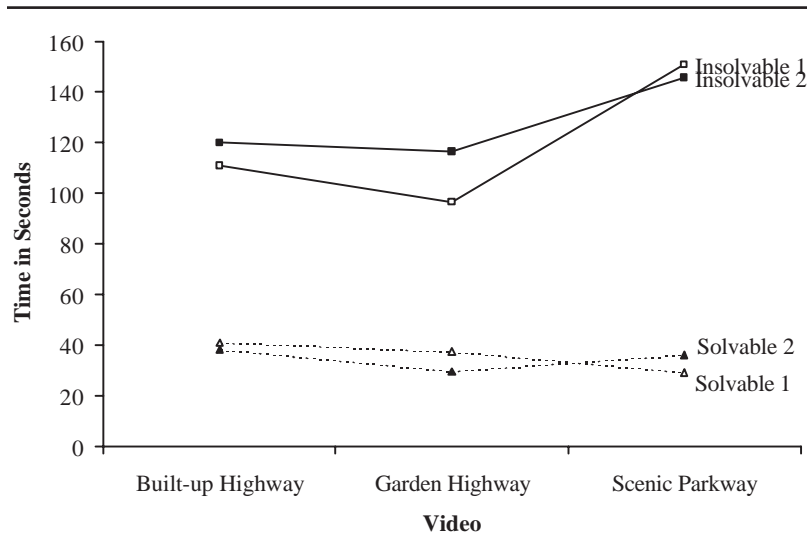


Figure 4: Solvability  $\times$  Video Interaction

### CONCLUSION

For anger, the bottom effect on anger scores prevented a meaningful test of the hypothesis. Participants lost most of their anger while viewing the short (4 minute and 45 second) video. Perhaps an effect would emerge with a higher prevideo anger level or a more realistic driving task. The passive experience of viewing a video may have helped dissipate anger. The real driving experience in congested conditions where the driver must maintain active engagement and where other cars cut in and out or stop and start abruptly might slow the drop in anger thus allowing the differences in anger across the conditions to emerge. Also, the confounding effect of higher traffic in the *Garden Highway* and *Scenic Parkway* may have obscured an anger effect if it was present.

The measure of frustration offered stronger support for the hypothesis. The participants had greater frustration tolerance after viewing roadways with more vegetation relative to built structures along the edges; the effect was most pronounced for the *Scenic Parkway* condition. Respondents viewing it worked almost a minute and a half longer on the unsolvable anagrams than respondents who viewed the other videos. This effect emerged in spite of higher traffic density—four times greater than for *Garden Highway* and

six times greater than for *Built-Up Highway*—and its related stress (Novaco et al., 1990).

These findings for frustration tolerance support earlier findings on the restorative effect of nature (Hartig & Evans, 1993; Parsons et al., 1998; Ulrich, 1979; Ulrich et al., 1991), but one wonders why the frustration tolerance for *Garden Highway* and *Built-Up Highway* did not differ more. A subsequent analysis directly scaled the physical features of each tape. Using a 0.5-inch grid, we measured the amount of vegetation, pavement, cars, and built material (buildings, bridges, signs, poles, and wires) for 10 scenes on the tape. In addition to the opening scene, we captured scenes every 30 seconds. Table 2 shows the averages of the 10 scenes measured in square inches. You can see that *Scenic Parkway* had more than four times as much vegetation as did *Garden Highway* or *Built-Up Highway*. In contrast, *Scenic Parkway* had about one fourth as much built up material as *Garden Highway*, which had about one fifth as much built up material as *Built-Up Highway*. The total space accounted for (the sum of the means in each column of Table 2) is twice as much for *Scenic Parkway* than for either of the other conditions. Had we counted the sky, the totals would be the same. The higher number for *Scenic Parkway* reflects the trees that block out the sky (visible in the other conditions) on the edges of the road. The ratio of vegetation to built-up material along the highway was highest for *Scenic Parkway* (172.7) followed by *Garden Highway* (11.0) and then *Built-Up Highway* (2.3). Furthermore, the ratio is reversed for the *Garden Highway* and *Built-Up Highway* condition in that, unlike *Scenic Parkway*, they each have more built-up material than vegetation. Although we expected the two-lane *Scenic Parkway* to have less pavement visible than the other roads, it had a comparable amount to *Built-Up Highway*. Grade changes in *Scenic Parkway* made more pavement in front of the vehicle visible. Adding pavement to the built-up material showed that the ratio of vegetation to all of the built-up material was higher for *Scenic Parkway* (3.5) than for *Garden Highway* or *Built-Up Highway* (both at 0.6).

Beyond the higher traffic in *Garden Highway*, which could have depressed the effect, *Garden Highway* and *Built-Up Highway* had similar amounts of vegetation along the road (Table 2)—roughly one fifth the amount measured on *Scenic Parkway*. *Scenic Parkway* had fewer lanes and a wide, green median rather than the concrete barrier in the other conditions. The reduction in stress (Ulrich et al., 1991) or increase in attention restoration (Kaplan, 1995) may have arisen from vast amounts of natural material and the high proportion of natural to built-up material along the *Scenic Parkway*. From a stress-reduction theory perspective (Ulrich et al., 1991), nature reduces stress for evolutionary reasons. From an attention-restoration perspective (Kaplan, 1995), the restorative experience may relate to several factors present only in

**TABLE 2**  
**Physical Characteristics of Each Video**

	<i>Built-Up Highway</i> Mean Square Inch (SD)	<i>Garden Highway</i> Mean Square Inch (SD)	<i>Scenic Parkway</i> Mean Square Inch (SD)
Vegetation	29.0 (10.7)	28.5 (16.1)	120.9 (38.9)
Built-up material	13.0 (10.5)	2.6 (1.5)	0.7 (1.9)
Pavement	34.4 (7.6)	47.1 (7.8)	33.8 (11.0)
Cars	0.3 (0.4)	3.2 (5.6)	3.5 (6.1)

the *Scenic Parkway*: soft fascination, extent, and compatibility. The rich vegetation in *Scenic Parkway*, its curves, and grade changes may have helped evoke a feeling of being away, greater extent, and increased compatibility for driving. Measures of the amount of time occupied by turns and grade changes on each video found that *Scenic Parkway* had more time in these changes (4 min 36 s) than *Garden Highway* (3 min 33 s), which had more time than *Built-Up Highway* (2 min 35 s).

Our findings may not apply to actual drivers in heavier traffic. The sheer number of cars and trucks, the ways in which large vehicles block views, vehicle unpredictability, and the way other cars may thwart the driver's intentions may all contribute to frustration and anger and may reduce or overpower any effects of roadside vegetation. Future research would do well to test the effects of roadside vegetation in more realistic conditions with real traffic. It might test the relative importance of traffic volume, the amount and visual prominence of vegetation, and other roadside features such as concrete noise control barriers. It might test each of the features of *Scenic Parkway*. Although trees along the road might not be the primary variable in frustration and stress, if they do have restorative value, then roads designed with such features might offer drivers an escape. Drivers could avert their eyes from cars to vegetation or other scenic features. In light traffic (weekend) conditions, however, the scenic designs may offer something more. During the 1920s, the Taconic State Parkway commission built "a 103-mile long highway for the fun of it" (Healy, 2002, p. 1). The parkway connects New York City to several state parks and the Catskill and Adirondack Mountains. Although such a project would not likely occur now, one wonders about its value as an escape. Healy (2002) described his drive as "like a dream" (p. 1). He quoted people describing the road as "a 110 mile-long postcard . . . the most beautiful road I've ever known. . . . Maybe it tends to soothe the savage beast" (p. 1). He wrote, "There are no billboards on the Taconic, no hideous rest stops, no tolls, no guard rails and no trucks. What there is, in abundance,

is trees—trees lined up along the roadside and clusters of oaks, pines, and maples on the median” (p. 1).

#### NOTE

1. *Built-Up Highway* had less traffic (4 vehicles traveling in the same direction) than *Garden Highway* (16 vehicles), which had less than *Scenic Parkway* (18 vehicles). These differences also appear in physical measures of 10 snapshots from the videos (Table 2).

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