EMPOWERED PUBLIC PARTICIPATION
in the
DESIGN of the TURTLE CREEK VIADUCT

Pittsburgh, Pennsylvania

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ABSTRACT

Bridges are prominent features of many landscapes. They are justifiably called on to meet public objectives beyond their transportation function, such as the facilitation of economic development, the enhancement of an urban environment or even providing a symbol for the community they are in. When such objectives are developed by means of a recognized community involvement process, meeting them becomes a legitimate use of public transportation funds. This paper will describe techniques used to incorporate contextual and urban design concerns into the design of a major viaduct through the commercial and cultural center of a historic industrial town.

The viaduct is part of a much larger urban toll road project under development by the Pennsylvania Turnpike Commission (PTC). The PTC established community Design Advisory Teams (DATs) and empowered them to make basic decisions about the design of the project in their communities. This paper describes the process and its results.

Key Words: aesthetics, bridge, urban design, historical, public involvement

INTRODUCTION

Project Background

Bridges are prominent features of many landscapes. They are justifiably called on to meet public objectives beyond their transportation function, such as the facilitation of economic development, the enhancement of an urban environment or even providing a symbol for the community they are in. When such objectives are developed by means of a recognized community involvement process, meeting them becomes a legitimate use of public transportation funds.

Identifying these objectives requires thoughtful interaction with the involved community. This paper describes pioneering techniques that were used to incorporate the urban design and economic development concerns of the Borough of Turtle Creek, Pennsylvania into the design of a new four lane viaduct through the commercial and cultural center of the town. Through the empowerment of its Design Advisory Team, Turtle Creek became a true partner in the design of the viaduct, influencing it in fundamental ways that will reduce its impact on the existing town center and enhance the center’s future redevelopment.

The viaduct is a key part of the MonFayette (MF) Expressway from PA 51 to I-376, a 24 mile urban toll road which connects the formerly industrial communities of the Monongehela River Valley to the Pennsylvania Turnpike at Monroeville and to downtown Pittsburgh (Fig. 1). The “Mon Valley” communities developed as mill towns based on rail and barge access, and have never had decent highway access, let alone the level of access demanded by modern commercial and industrial development.
As part of the Final Environmental Impact Statement (FEIS) for the MF Expressway the PTC committed to establishing five independent community Design Advisory Teams (DATs) in the communities most strongly affected, and empowering them to make basic decisions about the design of the project in their communities. The FEIS was approved with a Record of Decision (ROD) in January, 2005. The DAT process started in March, 2005. The project reached the end of the preliminary engineering phase in the autumn of 2007. It is anticipated that the DATs will continue to function through final design, right of way acquisition and construction.

The commitment to the DATs was part of an overall Project Approach established by the PTC with a series of guiding principles. The PTC’s first goal was to set a new standard for urban expressway design with innovative aesthetic treatments, sensitive urban design features and related enhancements. The principles include an extensive public outreach program, of which the DATs are an important part. PTC’s final goal is for the MF Expressway to be a “Good Neighbor”, one that “complements the communities through which it passes”.

Figure 1. MonFayette Expressway, PA 51 to I-376, Design Advisory Team Areas
The Borough of Turtle Creek

The topography of the Pittsburgh area consists of steep-sided valleys separating hill-top plateaus. Generally, the valleys offer the only feasible location for transportation, so that the valley floors are occupied by railroads and roadways, with industrial and commercial development strung along the railroads wherever the valleys widen. Residential areas are mostly on the valley sides or on the hilltops. The Borough of Turtle Creek follows this pattern.

The borough developed in the valleys of Turtle Creek and its tributary, Thompson Run. Its industries developed along the mainlines of the Norfolk Southern Railway (originally the Pennsylvania Railroad’s east-west mainline) and the Union Railroad, both of which still operate in the valley. The most significant industry in the borough was the Westinghouse Electric Company, which occupied a large part of the level land in the valley of Turtle Creek. At the north end of that complex, where Thompson Run joins Turtle Creek, the center of the borough developed, with stores, civic buildings and churches grouped along Penn Avenue and Grant Street.

Figure 2. Penn Plaza Shopping Center with St. Colmans Church and School Beyond.

In the 1960’s the retail center of the borough began to experience competition from newer, larger stores along nearby US 30. Then, in the 1970’s the Pennsylvania Department of Transportation extended the Triboro Expressway, a four lane boulevard, through the borough, which changed traffic patterns and removed some of the retail buildings along Grant Street. In effort to revive retail activity in Turtle Creek, a new auto-oriented shopping center called Penn Plaza was built as an urban renewal project, removing most of the remaining retail buildings. (Fig. 2). This center has never been completely successful and is at present about one-third vacant. However, it is the only realistic retail resource for the many senior citizens residing in Turtle Creek. Finally, in the 1980’s
Westinghouse closed its facilities in Turtle Creek, and the borough suffered the last of the major setbacks from which it is still trying to recover.

The civic and cultural center of the borough remains strong. Four major churches with active congregations remain. Allegheny County has located a social services center and an elderly housing community in downtown Turtle Creek. The borough has modernized its borough hall and police station, and the public middle school there is still in use.

The MonFayette Expressway as it Emerged from the FEIS

Because of the topography the only feasible route for the MF Expressway is along the Turtle Creek and Thompson Run valleys. During the FEIS several options were studied that placed the highway on the hillsides or in the center of town. All of the hillside options required large residential displacements and were dropped. The alignment that was finally adopted placed the highway in the center of the downtown, threading it between the churches and over the top of Penn Plaza (Fig. 3).
The alignment was visualized as a viaduct, with the anticipation that commercial and recreational uses could be restored in the space below it (Fig. 4). There is no interchange planned in Turtle Creek. However, one is planned in North Versailles, about a mile south of Penn Plaza on the Triboro Expressway.

Figure 4. Rebuilt Penn Plaza as visualized in the FEIS

THE DESIGN ADVISORY TEAM PROCESS

Design Advisory Team Membership and Organization

The Turtle Creek (TCK) DAT consists of 12 community stakeholders, along with five technical team members. The initial group of community stakeholders was identified by asking known public entities and interest groups in Turtle Creek to name representatives. At the first TCK DAT meeting, the DAT identified additional community members needed to complete a representative membership group. Of the community members eight reside in Turtle Creek; the others represent Turtle Creek organizations but live elsewhere.

The technical team members include the PTC’s project manager for the entire MonFayette project, the design engineer and urban design and environmental consultants. The role of the environmental consultant is to evaluate deviations from the FEIS to determine if they are material and, if so, what
additional environmental review steps are necessary. None of the decisions made by the TCK DAT were considered material changes.

TCK DAT meetings were held in a restaurant in Penn Plaza, physically locating the DAT itself right at the center of their concerns.

**DAT Empowerment**

The DATs were empowered by the PTC to make decisions about the design of the MonFayette Expressway in their community. Thus, the title “Design Advisory Team” is a misnomer, as the team was essentially a design decision team. If the DAT were to be unable to reach a decision then the matter was to be referred to PTC’s Project Leadership Team, PTC executives who oversee overall policy direction for the project. However, the Turtle Creek DAT didn’t experienced instances of being unable to reach a decision; therefore, no decisions were relinquished to the PTC Project Leadership Team, and all decisions made by the DAT were accepted as final by the PTC.

That the PTC placed the decision-making power in the hands of the DAT and made a commitment toward implementing each decision was key to the success of the DATs. This empowerment resulted in the establishment of trust early in the process. More important, having been empowered, the DAT acted in a responsible manner, considering all of the pros and cons, including costs. This contrasts with the assumptions often made by transportation agencies, that if they give decision-making power to the public, the public will not act responsibly.

**Effects on Project Budgets and Cost Estimates**

The PTC decided from the beginning to handle the costs of features requested by the DATs the same as requests from any other entity or agency. To illustrate what this means, the Coast Guard requested an increase in span for the MonFayette’s Monongehela River bridge because, in its judgment, the increased span will improve marine operations. That cost was simply accepted as a part of the cost of the project. No one considered it a premium or added cost. Similarly, when the Turtle Creek DAT decided, in its judgment, that a higher viaduct will better support the economic redevelopment of Turtle Creek, that cost also was accepted as a cost of the project. Given that the stated purpose of the MF Expressway is to enable and encourage economic redevelopment, that made obvious sense. The PTC considered all of the features decided on by the DATs necessary and appropriate parts of the project.

Furthermore, the PTC did not subject the DATs to rigid budget limitations. That reflects the fact that rigid budgets cannot be established for large projects like the MF Expressway until much later in the design process because too much is unknown. It is necessary to go through the preliminary design process to identify necessary features, which then become part of the project cost. Cost control then focuses on designing those features in the most cost-effective way.

The differential costs of the various DAT design options were provided to the DATs prior to them making their decisions, and the DATs made their choices in full knowledge of what the differential costs would be. Their decisions were based on their judgments of the cost effectiveness of the options in meeting their objectives.
Consensus

The DATs began work by establishing their Charters, which covered purpose, goals, structure and operations. DAT decisions were based on Consensus among those DAT members in attendance at that particular meeting with each member (community and technical) having equal standing. Consensus was defined as agreement by everyone in attendance to accept a proposed solution, even if one or more members had some reservations.

Once a DAT reached consensus on a decision, it was documented in the form of a Decision Chronicle. The wording of each Decision Chronicle was reviewed and approved by the DAT before it was finalized and accepted.

The Charters recognized that there might be situations where a member was willing to accept the preference of the majority but wished to register his/her dissent. In that situation the Charters provided for Consensus with Dissent Noted. However, this option was never exercised in the TCK DAT. There were no dissents to any of their Decision Chronicles.

TCK DAT Issues

In its second meeting, the TCK DAT developed a list of 31 community issues raised by the proposed expressway. The basic concern was community cohesion, particularly the effect on Penn Plaza businesses and the churches. Residual negative perceptions from the bisection of the community by the Tri-Boro Expressway reinforced this concern. Visual impacts of the overhead structures across the downtown were also a major concern. Other issues included flood control along Thompson Run and relocation housing.

This list of issues was ultimately sequenced by categorizing each issue as either “most urgent,” “next most urgent” or “details.” Categorizations of urgency were based on the community sensitivity of the issue as viewed by the DAT and on the need to address an issue so that the design engineer could meet preliminary and final design schedules. The DATs focused on resolving the “most urgent” issues first.

TCK DAT Deliberations

Many of the community members knew each other. Some were long-time residents who spent their childhoods in Turtle Creek. So there was a natural understanding and concern for the town. Yet, these people are not engineers, didn’t know the terminology and could not be expected to understand a two-dimensional engineering drawings. None of the technical team members were raised in Turtle Creek and none reside there at present.

However, as the first “Most Urgent Issues” were discussed, and the community members and technical members developed familiarity with each other’s knowledge and concerns based on the face-to-face contact, the technical team was able to develop different design options that addressed the community’s concerns. These were presented as renderings and drawings that allowed the community members to understand them. The community members were surprised and delighted
to know that such options existed and, even more important, that the technical team was listening to their concerns.

The DAT as a whole would discuss the options, narrow the field, and then ask for refinements and/or more information. If there were dissenting parties the DAT would reexamine the issues, ask for additional options and then seek a compromise solution. This process would continue, sometimes over several consecutive meetings, until a resolution was reached.

An example of the visualization techniques used was a visit to the alignment adjoining the meeting location. The entire DAT walked through Penn Plaza and along the corridor and viewed helium balloons that the technical team had tethered at the correct height along the edges of the proposed viaduct. Tall surveyor stakes were also placed at potential pier locations. They gave the DAT a way to visualize the position of the viaduct and its piers where they would actually be within their community.

The TCK DAT resolved 28 of its 31 issues during preliminary design. The remaining three issues are details that will be addressed in final design.

DAT Outreach

One of the responsibilities of the DATs is to keep the larger community informed of their deliberations. The Turtle Creek DAT chose to do this by participating in a pair of annual summer festivals held in Turtle Creek, a fair sponsored by St. Colmans Church and the Turtle Creek Lawn Fete. The DAT set up booths at these events using the displays that had been prepared for the DAT meetings. The DAT members, both community and technical team, staffed the booths, answered questions and solicited feedback from interested visitors.

DEVELOPMENT OF THE VIADUCT DESIGN

Engineering Basis from the FEIS

As is typical for most major projects, the engineering done for the FEIS was at a large scale with a limited amount of detail. The PTC anticipated that the alignment developed during the FEIS would be refined during preliminary design based on more detailed information. In most other projects this refinement is done by the design engineers based on their understanding of the needs of the project and the community. It is then presented to the community. Since the engineers inevitably miss something the community considers important, the community immediately feels threatened. Time and energy are wasted while they express their frustration and try to communicate their concerns.

The PTC took a different approach. Using the DAT process the community was brought into the design process as a full partner at the very beginning, before any engineering was done. The community defined its needs by identifying its issues. This was done before the engineers started spending design hours. The engineers were able to start out in the direction the community desired
Public Involvement in the Design of the Turtle Creek Viaduct
November 15, 2007

without any guesswork or false starts. Since the community saw that it would be involved from the very beginning, whatever apprehension or hostility they had quickly evaporated, and the discussions immediately focused on productively developing the design. Four of 28 issues the DAT resolved specifically determined the design of the Turtle Creek Viaduct and are discussed here.

**Viaduct Height**

The primary goal of preliminary design as defined by the PTC is to establish the exact line and grade of the highway within the corridor defined by the FEIS. Preliminary design also provides conceptual type, size and location (TS&L’s) for structures and preliminary identification of utility impacts, right-of-way acquisition and needed permits.

Bridge heights are usually set by topography or by minimum clearances for highways or railroads under the structure. The height of the Turtle Creek Viaduct was set by a third criterion: the height that the community thought necessary to maximize the redevelopment potential of the area around and below the viaduct. Almost the very first question that the DAT asked was, how high will the bridge be? The designers asked in return, how high do you want it? The response was, as high as we can get it.

To be more specific, the community’s goal was to maximize the amount of daylight reaching the area under the bridge, to minimize the apparent size of the bridge as seen from various points in the town center, and to minimize the noise. All of these were served by making the bridge higher (Fig. 5).

![Figure 5. Section at McMasters Church](image)

With regard to maximizing daylight, light enters the space under the bridge as direct sunlight and, more importantly, reflected light from particles in the atmosphere and clouds. Consequently the
whole “dome of the sky” is the light source. The higher the bridge, the less of the dome that the bridge will cut off, and the brighter the space under the bridge will be.

Plants require both light and moisture. The higher the bridge, the more light underneath and the more likely that wind-blown rain can penetrate the space below the bridge.

Finally, the deck and parapets of a bridge act to shield the space below from the noise of vehicles on the bridge. The higher the bridge the wider the resulting noise “shadow”. If the bridge is high enough the length of the transmission path to points outside the shadow will attenuate the noise to below ambient noise levels.

Based on the DAT’s direction the designers developed several options for the profile ranging up to the highest that could be obtained without causing problems for trucks. 3D views were prepared which showed the height of the viaduct from various vantage points. The DAT picked the highest option. This put the roadway at about 97’ above Penn Plaza at its highest point, roughly 32’ higher than the elevation developed for the FEIS. Achieving this profile required a crest vertical curve roughly centered on the downtown. This curve was lengthened beyond the minimum required for sight distance. It extends for nearly the whole length of downtown, giving the viaduct a gentle arched appearance above the town center.

The revised profile puts the viaduct higher than the steeples of the churches (Fig. 7). This was seen as an advantage, because from a distance the viaduct will seem to frame the churches rather than truncate their steeples. To put this height in proportion to the valley as a whole, the hill-tops bordering the valley are roughly 350’ higher than the valley floor. From almost every surrounding viewpoint the viaduct will still seem to nestle within the valley.

Finally, the height of the bridge widened the noise shadow to the point that noise was eliminated as a concern within the downtown area.

**Pier Placement/Structural Type**

Given the DAT’s keen interest in maximizing the redevelopment potential of the areas around and under the viaduct, the appearance of the structure and the placement of piers became key issues.

The viaduct will essentially be the ceiling of a large outdoor area in which the borough hopes to see a lot of human activity. Their first criterion was that the structure not provide roosting spots for birds. The DAT did not want to see visitors to their town center dodging bird droppings or viewing the decay that bird droppings create. In part, this concern was a result of a DAT field trip to older viaducts in the Pittsburgh area where they saw these problems for themselves. Also, the DAT asked that the entire viaduct be of a single structural type, so that it would have a consistent appearance throughout the downtown.

The DAT was also very concerned that the piers not end up in front of a church door or in a church parking lot. With the DAT’s participation a plan was created indicating all of the locations where a pier could not be placed. When combined with clearances over streets and sidewalks several spans of at least 195’ will be required.
All of these considerations, taken together, ruled out welded plate girder and precast concrete girders. Further development was based on an assumption of either concrete box girders or steel tub girders. In order for the DAT to become more familiar with these structural types, the DAT took a field trip to Harrisburg, Pennsylvania to view the PTC’s new mainline bridge over the Susquehanna River, which is a precast segmental concrete box girder.

![Figure 6. Views of 195’ and 320’ Span Options from the Tri-boro Expressway](image)

Options for span arrangements were developed with spans ranging from 195’ up to 320’. 3D views of these options were presented to the DAT (Fig. 6). After viewing the renderings and simulated viaduct/pier locations in the field, the DAT decided that the smaller spans placed too many piers in the town center, limiting views through the center and reducing the sense of openness necessary for the area to be viable for redevelopment. They asked for a plan to be developed that kept spans above 250’ and placed piers in optimal locations relative to each of the nearby churches. A revised
Public Involvement in the Design of the Turtle Creek Viaduct
November 15, 2007

plan meets these criteria using two span lengths, 250’ and 305’. It will be investigated further in final design.

**Business Relocation and Construction Staging**

Several of the remaining tenants of Penn Plaza are of continuing value to the Turtle Creek community. The DAT was very concerned about keeping these businesses operating in Turtle Creek throughout the construction process. Resolving this concern required two actions. The first was to develop a plausible method of relocating the businesses to nearby properties before their current locations are required for the construction of the MF Expressway. The second was to communicate this possibility to the businesses themselves so that they did not grow discouraged and leave prematurely.

![Figure 7. Development Opportunities Map](image)

As a first step several vacant parcels in the downtown bordering the viaduct and Penn Plaza were identified. An overall plan was developed showing how these parcels could be used to provide sites for relocation of the key businesses (Fig. 7). The plan also showed that the area under the viaduct, given the long spans anticipated, could be used for parking to support new additional businesses, as well as for a linear park along Thompson Run that would add an amenity to the downtown.
To make sure that this plan would meet the needs of the individual businesses, a more detailed version was done showing how the space and parking needs of the key businesses could be met during the several stages of construction (Fig. 8). These plans were discussed individually with the key businesses and refinements were made to respond to their comments. The final plan then was put into a Memorandum of Understanding between the borough, the PTC and the businesses. It is anticipated that this memorandum will sufficiently reassure the key businesses that that they will continue to keep their businesses operating in Turtle Creek.

![Figure 8. Penn Plaza Relocation Plan](image)

**Changes in Project Cost**

The additional profile height added about $5.1 million to the cost of the viaduct. The effect of the DAT preferences for pier placement is impossible to evaluate at this time because the necessary information will not be available until final design. An optimum span arrangement based on balancing girder and pier costs had minimum spans of about 195’. However, this arrangement placed piers in Thompson Run and probably would not be approved by the permitting agencies. The eventual solution will probably involve some combination of span arrangement and relocation of Thompson Run. At this time it is not clear that there will even be a differential cost attributable to DAT span preferences.

The identification of land for the business relocations has no cost implications because the land involved was either already planned to be acquired by the PTC or is owned by the Regional Industrial Development Corporation, which is anxious to see it redeveloped.
The cost of the entire section of the MF Expressway through Turtle Creek was estimated at $157 million at the end of preliminary engineering. The total differential cost attributable to DAT decisions to date thus amounts to about 3% of the total project. The DAT and the PTC clearly believe that the improved development potential created by these changes is worth the additional costs involved.

**Next Step: Final Design**

Over the next two years the TCK DAT, working with the Section Designer, will be finalizing the structural type and span arrangement and developing specific designs for the piers, parapets, lighting and railings. Also, design of the features at ground level will be developed, including the layout of parking areas and the linear park. Finally, detailed right of way plans and business relocation plans will be developed before PTC undertakes right of way acquisition. Funding for right of way acquisition and construction is presently uncertain, so no schedule has been set for these activities.

**REFLECTIONS ON THE DAT PROCESS**

**DAT Member Attitudes**

Three community members of the TCK DAT were asked to comment on the decisions about the height, pier placement and line and grade of the viaduct. The three represent a wide age range and varied occupational roles in the community. Each began their experience on the DAT with some apprehension that their views would not be considered. Their experience changed their attitudes.

Each thought activities like visiting other bridges, seeing 3D drawings of options and using balloons to show the height and the distance between piers was very helpful. The give-and-take interaction with the technical team members was also very helpful. Their conclusion is that they feel very positive about the outcome, see the process as a tremendous opportunity to improve the community and see themselves as ambassadors to others in the community.

The turnaround in attitude among the community members of the Turtle Creek DAT was the result of several factors:

- Early positive experiences created momentum. The DAT faced an early challenge in determining the height of the viaduct. Addressing the problem quickly and with a wide range of options gave the technical team an opportunity to demonstrate both its knowledge and its sincerity. This quickly built trust and made later issues easier to resolve.
- PTC placed much decision-making power in the hands of the DAT, made a commitment toward implementing each team’s decisions but did not impose a rigid cost ceiling. The DAT’s resulting ability to freely examine alternative solutions contributed to the development of trust. This evidence of trust in the DAT by the PTC encouraged reciprocal trust from DAT members.
- Because of the face-to-face nature of the DAT process, it was natural for more trusting relationships between technical and community members to evolve.
Public Involvement in the Design of the Turtle Creek Viaduct  
November 15, 2007

A telling story of the impact of trust building occurred in the restaurant where the DAT met. When the process began the waitress who served the monthly meals was very cool. As she watched the renderings and ultimately the development opportunities plan emerge over ensuing months, she became friendly and inquisitive. She witnessed her fellow residents work with design issues with growing enthusiasm. Her growing positive attitude became a topic in her neighborhood and among friends – spreading the word about the DAT’s success.

The attitudes of the technical members of the team were also important. The DAT process differs from most engineering. The design consultants were oriented at the beginning to the different approach that would be expected. This created a responsiveness and eagerness among the consultants that built trust, encouraged open minds and facilitated the development of creative solutions.

**Necessary Members of the Technical Team**

The inclusion of urban designers/landscape architects in the DAT process as independent sources of feedback and assistance was invaluable. Many of the DAT issues were not solely or even primarily engineering matters. Without the skills and perspective of an urban designer/landscape architect these issues could not have been resolved, which would have frustrated the entire process. The Development Opportunities Plan was first introduced at the Turtle Creek DAT at the suggestion of the urban design member. By demonstrating the possibility of a positive resolution of several of the DAT’s major issues the Development Opportunities Plan became a major factor in the success of the Turtle Creek DAT.

The presence on the DAT of a management-level PTC representative was also critical to the success of the DATs. Community members were confident that their concerns were heard and understood face-to-face by someone in authority. DAT decisions were quickly confirmed, usually on the spot. The resulting trust, as well as the time saved in not having to refer decisions up the PTC chain of command, made the DAT process very efficient.

**Design Schedules and Costs**

The MF Expressway’s design consultants all reported that the DAT process and chronicled decisions met their decision needs and design schedules. The TCK DAT not only kept the schedule needed by its design engineers, it finished two months earlier than required.

The preliminary engineering phase culminates in a Design Field View (DFV) meeting. The designers were accustomed to having many unexpected unresolved issues coming up at DFV and having to make design modifications afterward. Many of the designers commented on the differences in the DFV’s where DATs were involved. The TCK DFV meeting was typical in that it was relatively brief and did not result in any reworking of designs. This result in itself represents a cost savings.
Project Costs

The DATs were empowered to develop features that affected the cost of the project. They used this freedom wisely. In some DATs, as in Turtle Creek, the costs were higher. In other DATs they were lower. Over the entire MF Expressway project the decisions of all of the DAT’s, taken together, resulted in a net $80 million decrease in the construction costs for the project. There is no reason to be surprised that the DATs acted wisely. After all, DAT members are taxpayers too, and share with all taxpayers concern about the wise use of public funds.

It must be remembered that the PTC had a representative on every DAT who could voice caution about unreasonable costs. Because of the face-to-face relationships that developed, those cautions were heard and respected.

Reactions of PTC and FHWA

PTC staff with decision-making powers were members of each DAT and thus participated in and approved each DAT decision along the way. The Division Office of the Federal Highway Administration (FHWA) monitored the process closely and attended many meetings. They have uniformly supported the process and its results.

Recommendation for Other Projects

By empowering the Turtle Creek DAT, and through it the entire Turtle Creek community, to be true partner in the design of the Turtle Creek viaduct, the PTC resolved a potentially contentious design problem in a way that both satisfied the community and met the agency’s cost and schedule goals. Transportation agencies facing similar complex and important problems in urbanized areas should give consideration to a similar Design Advisory Team process.

More Information

The description of how the Turtle Creek DAT functioned was excerpted from a 268-page report on the entire DAT process by the facilitators, Olszak Management Consulting, Inc. The full report covers all of the DATs in great detail, and is available at: 