A Holistic Approach to Thoroughfare System Improvements

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INTRODUCTION

The Three Approaches to Reducing Traffic Congestion

There are three approaches currently being applied to solve the nation's burgeoning traffic congestion problem (and resulting air quality problem): supply, demand, and operational. Each of these approaches has its fervent advocates and detractors. Each has its benefits and its consequences. Each has its purpose, and if applied properly, can reap tremendous benefits in reducing traffic congestion and improving air quality. Each is interdependent on the others.

The supply approach says that capacity is increased (and, consequently, congestion is reduced) by providing additional laneage. A computer analogy to this approach is to add hard drive storage capacity by adding an additional hard drive. This approach has been, and still is, the most commonly used approach to address traffic congestion. Most bond and capital improvement programs are based on a supply approach to solving traffic congestion.

The demand approach says that capacity is increased and congestion is reduced by reducing the number of vehicles using the existing facility, thus freeing capacity. A computer analogy to this approach is to increase hard drive storage capacity by deleting files. The classic demand-approach strategy is the introduction of mass transit, as a bus (theoretically) takes the place of sixty cars (if each passenger drives his or her own car); thus, the cars have been "deleted" from the roadway, freeing-up much needed space without having to provide a larger roadway. Other demand approach strategies include flexible work hours (transferring demand from the time of minimum available capacity to a time of greater available capacity) and telecommuting.

The operational approach says that capacity in increased and congestion is reduced by improving the performance and efficiency of the existing facility. A computer analogy to this approach is to increase hard drive storage capacity by compressing seldom used files. The files are still there; the space is used more efficiently. Under an operational approach to traffic management, the number of vehicles would still be the same, but the existing capacity would be used more efficiently.

The Dallas County Major Capital Improvement Program

In Fiscal Year 2000, Dallas County replaced its traditional bond-financing approach to funding infrastructure improvements with a programmed Major Capital Improvement Program (MCIP). The underlying concept of this new approach is that a project will take five years or less from approval of funding to initiating final construction, and that every year projects are authorized for funding and projects will be completed. Thus, in any given calendar year, at least one project will be in each of the various phases of implementation (i.e. design, right-of-way acquisition, construction), thereby allowing for the more efficient use of personnel and resources.

In contrast, under the bond-financing method, all projects are authorized at the same time and are constructed at the same time. This approach creates a project "wave"—initially, there is a flurry of design activity, and the necessity of design resources; then, the wave passes to right-of-way acquisition, and the design resources become underutilized while right-of-way is bulked to handle the "wave"; finally, the projects pass to construction, creating the need to invest in construction-related resources, while the design and right-of-way resources are underutilized.

With the new financing and programming approach, the "project wave" is eliminated, and all project activities are occurring simultaneously (although not necessarily on the same project) and, more importantly, continuously. Thus, valuable resources are always being utilized and the funds that previously would have needed to be expended on additional resources (as a result of the "wave" effect) can instead be devoted to infrastructure.

This Program is implemented by issuing an annual county-wide call for projects to identify and fund needed roadway improvements within the county, with local governments submitting candidate projects for potential selection and funding under this program. An annual "Call-for-projects" is an improvement over Dallas County's traditional method of calling for projects every five years, and has several advantages. First, with fewer submittals per Call, the quality of submittals, both of the projects submitted and the submittals themselves, will improve, as staffs will be able to devote more time per submittal. Second, an annual Call provides more flexibility for cities to determine infrastructure needs based on changes that may have recently occurred or will soon be occurring, such as a new development or infrastructure, instead of trying to determine needs based on a conjecture of what might occur five years into the future. Third, funds will be made available annually, thus providing greater flexibility in determining the amount of funding available. During periods of greater tax revenue, greater funds will be available for capital improvements; conversely, when tax revenues decrease, thoroughfare improvement funding will decrease. This funding flexibility helps ensure that adequate monies are always available to construct the projects for which funds have been committed, a significant and chronic problem with bond funding mechanisms.

For the first program year of the new financing system, a total of $15 million, distributed equally among the county's four legislative districts, was available. However, $207 million of county funds were requested for 86 projects. As only 7% of the total funds requested were actually available, it was necessary to create a methodology to evaluate and rank the projects in order to aid in the determination of which projects would receive funding.

Evaluating Evaluators

Before determining the evaluation criteria for the MCIP, a review was conducted of the evaluation criteria used to rank and score projects in the 1985 and 1991 Dallas County Bond Programs. Each evaluating criterion was analyzed with respect to effectiveness of intent, biases, and applicability to the MCIP. This in-depth review revealed that the evaluation criterion used in the previous bond programs were biased in favor of projects that increased supply at the expense of projects that addressed the demand or operational issues. Because of this bias, it was decided to discard many of the previous criteria, and to utilize criteria that embrace not only supply, demand, and operational parameters, but also social, political, environmental, and economic parameters. The result, then, is a “holistic” evaluation methodology consisting of ten equal criteria encompassing a broad spectrum of parameters.

EVALUATION CRITERIA

In order to evaluate candidate projects in an equitable and consistent manner, ten evaluation criteria were developed which were applied to each project submittal to establish a basis for scoring and ranking projects. This ranking identified which projects provided the greatest benefit to the county based on factors such as mobility, cost-effectiveness, safety, and air quality.

The ten evaluation criteria used in the holistic methodology are as follows: *Functional Classification Rating, Speed Delay Rating, Traffic Volume Rating, Traffic Volume Growth Rating, Travel Desire Rating, Benefit-Cost Ratio Rating, Accident Rate Rating, Air Quality/Energy Conservation Rating, Sustainable Development/ Redevelopment/ “Smart Growth” Rating,* and *Intermodal / Multimodal / Social Mobility Rating*. Each of these ten evaluation criteria yields a score between 0 and 10 points, with 100 points being the total maximum amount possible for any given project. This raw value is then multiplied by a “Local Cost Participation Multiplier” which assigns a weight to the raw values based on a city’s commitment to a project as indicated by the amount of local monies contributed. It should be noted that the multiplier is also intended as an equalizer between poorer and more affluent cities by assigning a higher multiplier to projects submitted by disadvantaged cities that meet prescribed eligibility requirements.

TECHNICAL METHODOLOGY FOR MODELING PROPOSED IMPROVEMENTS: Travel Model Forecast Procedures

The Dallas-Fort Worth Regional Travel Model (DFWRTM) is the planning tool used to help estimate current and future travel demand needs and allows detailed project evaluation to occur. The Major Capital Improvement Program must have a way of testing and evaluating the mobility benefits of a wide range of potential roadway projects, including the addition of new thoroughfare streets, the extension of existing thoroughfares, and the rehabilitation of existing thoroughfares. The DFWRTM is the tool used to accomplish this analysis.

In order to assess and quantify the benefits of the projects submitted under this Call-for-Projects, it is necessary to develop four different roadway network analyses. These four different network analyses simulate both baseline (year 1995 no-build) and future year conditions with and without the effects of the proposed projects. The four network analyses that are used to evaluate the benefits of the projects submitted for the Major Capital Improvement Program are as follows:

- Analysis 1: The first analysis replicates conditions as they existed in 1995, the year the model was validated for, using the roadway network that existed in 1995 and 1995 demographic data for population, employment, and number of households.

- Analysis 2: The second analysis predicts year 2020 conditions assuming a no-build, or "do-nothing" scenario. In this analysis, the 1995 existing-conditions roadway network used in the first analysis is modeled using year 2020 demographics. This analysis shows the performance of the transportation system in the year 2020 if no improvements are made to it.

- Analysis 3: The third analysis predicts year 2020 conditions assuming that all the projects submitted for funding are implemented and constructed. This is accomplished by coding into the 1995 no-build roadway network all the projects submitted under this Call for Projects, creating a year 2020 build network. The year 2020 build network is modeled using year 2020 demographic assumptions.

- Analysis 4: The fourth analysis predicts year 2020 conditions assuming an "all-or-nothing" scenario. This scenario uses the year 2020 build network and year 2020 demographic assumptions, but doesn't use the typical "capacity-constrained" technique to model traffic in which only a finite number of trips can be assigned to a particular roadway segment. With an "all-or-nothing" assignment, an infinite number of trips can be assigned to a particular segment, and where several different routing options are available, all trips are assigned to the most desirable route (based on criteria specified).

For this analysis, trips are assigned to the route with the best travel time, based on speed and distance only. This analysis is used to score projects under the Travel Desire Rating.

EVALUATION CRITERIA AND TECHNICAL METHODOLOGY FOR SCORING PROJECTS

Evaluation Criteria

Functional Classification Rating

This evaluator assigns points based on functional classification, and yields a higher value for a higher functional class. The concept behind the functioning of this evaluator is to give higher priority to more important facilities in order to achieve a greater overall impact. For any given project, the functional class assigned to the project will be the classification of the highest classified facility which can reasonably be assumed to be either directly or indirectly positively impacted by the proposed project.

Example Arterials A and B are parallel arterials one-mile apart. Freeway X runs perpendicular to both A and B and has interchanges at both. Approximately one-quarter mile from and parallel to Freeway X the City is proposing to build a four-lane roadway that will intersect both A and B.

Scenario 1: Freeway X is the only existing roadway that connects with both Arterials A and B. Thus, a motorist on A wanting to use B must use Freeway X. Under this scenario, the City's new roadway would be scored as a freeway, as it is reasonable to assume that it will reduce congestion on Freeway X by eliminating the necessity of all local traffic going from A to B to use Freeway X. In other words, there is a certain percentage of local traffic that is only using Freeway X by default that would divert to an alternate route. By eliminating this local traffic from Freeway X, its congestion is reduced and its reserve capacity is increased.

Scenario 2: Freeway X is one of several roadways that connect with both Arterials A and B. Thus, a motorist on A wanting to use B does not necessarily need to use Freeway X. Under this scenario, the City's new roadway would be scored by its own functional classification, as it is reasonable to assume that it will not reduce congestion on Freeway X because other routes for local traffic to travel from A to B already exist. In other words, local traffic diversion from the Freeway is already occurring, and the addition of another alternate route will not have an impact on the operation of the Freeway.

Each project will receive a score based on the classifications shown in *Table 1*.

Table 1

Functional Classification Rating

Functional Classification Designation	Score
Freeway (existing and proposed)	10 Points
Regional Arterial	7 Points
Other Arterial	3 Points
Not on Regional Thoroughfare Plan	0 Points

Speed Delay Rating

Each candidate project submitted for funding is assigned a Speed Delay Rating Score based on the magnitude of peak-period delay as represented by the "Degree of Congestion", a derivative of the "Delay Rate". Using delay as an evaluation criterion takes into account both the traffic congestion on and the physical condition of the roadway, both of which affect the operating speed.

The "Delay Rate" is defined as the difference between the time it takes to travel a set distance at the posted speed limit without stopping (free-flowing) and the actual time (observed) it takes to travel that same distance (accounting for traffic control delay and congestion), divided by the distance traveled, expressed in minutes per unit length (either miles or kilometers).

A 1996 report by **Metroplan**, the Council of Governments for Central Arkansas, established a delay rate congestion threshold of 0.41 minutes per mile or 0.238 min/km, based on criteria established in the *Highway Capacity Manual*, vehicle limitations, and driver perceptions.

In other words, a facility is considered congested when its delay rate is equal to or greater than 0.41 minutes per mile or 0.238 min/km. This number corresponds to the difference in time it takes to travel one mile at 55 miles per hour versus traveling one mile at 40 miles per hour. From this delay rate, a numeric value for congestion, the "degree of congestion" or DOC, has been defined as follows:

$$DOC = Delay\ Rate\ (min/mile) - 0.410$$

$$DOC = Delay\ Rate\ (min/km) - 0.238$$

Thus, a facility at the congestion threshold, that is, with a delay rate of 0.41 (min/mile) or 0.238 (min/km), has a DOC of 0.000. A facility operating at its maximum free flow speed has a delay rate of 0.00 and a corresponding DOC of –0.410 (English units) or –0.238 (SI units).

In order to provide insight into the magnitude of congestion, eight congestion categories were defined -- five for congested facilities and three for non-congested facilities. The DOC threshold for each of the eight categories is shown in *Table 2*, along with the points assigned for each category.

Table 2

Speed-Delay Rating Criteria

Category	English Units	SI Units	Score
Extreme	DOC > 4.500	DOC > 2.814	10 Points
Severe	1.500 < DOC ≤ 4.500	0.950 < DOC ≤ 2.814	8 Points
Serious	0.500 < DOC ≤ 1.500	0.328 < DOC ≤ 0.950	6 Points
Moderate	0.214 < DOC ≤ 0.500	0.150 < DOC ≤ 0.328	5 Points
Mild	0.000 < DOC ≤ 0.214	0.000 < DOC ≤ 0.150	4 Points
Borderline	–0.167 < DOC ≤ 0.000	–0.087 < DOC ≤ 0.000	2 Points
Acceptable	–0.410 < DOC ≤ –0.167	–0.238 < DOC ≤ –0.087	1 Point
None	DOC ≤ –0.410	DOC ≤ –0.238	0 Points

Traffic Volume Rating

This rating evaluates the project according to the magnitude of traffic-flow improvement that can be expected to result by making the proposed improvement to the facility. The Traffic Volume Rating is calculated by taking the difference between a "build" and a "no-build" condition, which yields the additional traffic resulting from making the improvement. Specifically, year 2020 traffic projections are generated with and without the improvements in place in order to model the anticipated change. Projects showing the greatest amount of traffic improvement receive a higher score for this criterion.

Specifically, this criterion is calculated by taking the difference between two year 2020 travel model runs, the “build” condition (Analysis 3) and the “no-build” condition (Analysis 2). The difference between these two analyses is the expected change in traffic volumes resulting from making the proposed improvement to the facility. In general, projects showing the largest amount of traffic improvement receive a higher score for this criterion. The maximum score available for this criterion is ten points. The range of possible scores is determined after the analyses are complete and the data is available to determine minimum and maximum values.

Traffic Volume Growth Rating

The Traffic Volume Growth Rating is derived from the growth in traffic volumes expected to occur on each candidate segment of roadway between the current condition (year 1995) and the future travel model projection (year 2020). This rating assumes that the project is not in operation in the current year and that it will be operational by the future forecast year. Points are assigned to each project based on the percentage of growth estimated to occur during this time period.

Specifically, the percent change between traffic volumes in the year 2020 “build” network (Analysis 3) and the 1995 “existing condition” network (Analysis 1) are calculated. Projects showing the largest amount of change receive the higher scores. The maximum score available for this evaluator is ten points. The range of possible scores for this criterion are determined until after the model runs are complete and the minimum and maximum values are derived.

Travel Desire Rating

This rating scores each candidate project based on its inherent attractiveness and desirability assuming there is no congestion at all on the facility. When congestion is factored into the equation, roadways that may be more direct and desirable to travel on are sometimes avoided because of high levels of congestion, even though they are the preferred routes. This evaluation criteria is derived by looking at the difference between a year 2020 capacity-constrained model run (Analysis 3), which takes into account the congestion on the roadway, and an "all-or-nothing" model run (Analysis 4), which assumes that there is no congestion on any roadway. The "all-or-nothing" model run allows vehicle trips to choose the preferred route (based on shortest distance and fastest speeds) regardless of any effects due to congestion. The percent difference between the two model runs shows whether the facility is being used because it is the most direct and preferred path ("all-or-nothing") or whether traffic is being diverted to the facility due to congestion on other routes (capacity-constrained). The maximum score available for this criterion is ten points. The range of possible scores is determined after the travel model runs are complete and the maximum and minimum values are identified.

Benefit-Cost Ratio Rating

This rating is calculated based on the ratio of benefits resulting from the proposed improvement to the cost of the improvement. The benefits for each project are determined from the reduction in travel-time delay experienced on the roadway segment with and without the candidate roadway improvement. Local government and Dallas County staffs estimate the costs for each project.

Benefits used in the B/C ratio are calculated from the delay savings gained from an increase in capacity or speeds on the segment (if, in fact, a gain is induced). The reduction in delay is calculated from the increase in average daily loaded speeds, which are derived from the travel model runs. This analysis compares the modeled speeds before an improvement (Analysis 2) and the speeds after the improvement (Analysis 3). After average daily loaded speeds and 24-hour projected traffic volumes are determined for both Analysis 2 and Analysis 3, a benefit-cost ratio is calculated based on the following equation:

$$\frac{TAB}{TAC} = \left[\frac{\left[\left(\frac{VOL^{A} * VOLFAC * LENGTH}{SPEED^{A}} \right) - \left(\frac{VOL^{B} * VOLFAC * LENGTH}{SPEED^{B}} \right) \right] \times DAO \times VOT \times NOD}{(\text{TOTAL COST} \times CRF)} \right]$$

Where: TAB	=	Total Annualized Benefit ($)
TAC	=	Total Annualized Cost ($)
Vol^{A}	=	24-Hour Volume from Run 2 (no-build scenario)
Vol^{B}	=	24-Hour Volume from Run 3 (build scenario)
VOLFAC	=	0.6, volume factor (peak/off-peak/directional dist.)
Length	=	Length of Project (miles)
$Speed^{A}$	=	Link Speed from Run 2 (no-build scenario)
$Speed^{B}$	=	Link Speed from Run 3 (build scenario)
DAO	=	1.29 persons per vehicle, Daily Auto Occupancy
VOT	=	$9.70 per hour, Value of Time
NOD	=	260 per year, Number of Days for annual benefit
Total Cost	=	Total Project Cost ($)
CRF	=	0.06646, Capital Recovery Factor (40 yrs @ 6%)

Points are assigned to each project based on the ratio of the total annualized benefits divided by the total annualized cost. *Table 3* provides the scoring ranges with their corresponding benefit-cost ratios.

Table 3

Benefit-Cost Ratio Rating

B/C Ratio	Score
0 – 0.50	0 Points
0.51 – 0.75	1 Points
0.76 – 1.00	2 Points
1.01 – 1.25	4 Points
1.26 – 1.50	5 Points
1.51 – 2.00	6 Points
2.01 – 3.00	7 Points
3.01 – 5.00	8 Points
5.01 – 10.00	9 Points
10.01 or greater	10 Points

Accident Rate Rating

Each candidate project receives an accident rating based on the number of correctable accidents reported on the roadway segment. A correctable accident is defined as an accident that will be potentially eliminated if the proposed improvements are implemented. For example, while traffic signals commonly reduce the number of right-angle accidents, they also increase the number of rear-end accidents. For traffic signals, then, only right-angle accidents are considered correctable and factored into the Accident Rate Rating.

Each city provides three years worth of actual accident data for each roadway segment submitted for review. Projects with a higher (correctable) accident rate over this three-year period receive a higher rating. After all the accident data has been analyzed, a range of scores is developed between zero and ten points, based on the magnitude of correctable accidents reported.

Air Quality / Energy Conservation Rating

Each project submittal is evaluated based on its overall impact toward improving the quality of the region's air. The Dallas-Fort Worth region is currently designated as a nonattainment area by the U.S. Environmental Protection Agency based on past exceedances of the national ambient ozone standard. In order to promote regional air quality goals and objectives, each project is quantified in terms of air quality reductions. Specifically, the dollars per pound of nitrous oxide (NOx) emission reductions will be calculated and each project will receive a score based on its reduction potential. Emission reductions are calculated by estimating emissions before and after the improvement is in place, and taking the difference. Projects contribute positively toward air quality reductions, in general, when speeds approach 50 miles per hour and operating performance is improved. The following formula provides the methodology for calculating emission reductions on a project-by-project basis.

$$\frac{\$}{\text{Lb.}} = \left[\frac{(\text{TOTAL COST} \times \text{CRF}) \times C_1}{\left[(\text{VOL}_B \times \text{EF}_B \times \text{LENGTH}) - (\text{VOL}_A \times \text{EF}_A \times \text{LENGTH})\right] \times 260 \text{ DAYS/YEAR}} \right]$$

Where:

VOL_B	=	24-hour modeled volume before improvement (Analysis 2)
EF_B	=	Emission factor based on speeds from Analysis 2 (grams/mile)
Length	=	Project Length (miles)
VOL_A	=	24-hour modeled volume after improvement (Analysis 3)
EF_A	=	Emission factor based on speeds from Analysis 3 (grams/mile)
Total Cost	=	Total project cost ($)
CRF	=	0.06646, Capital Recovery Factor (40 yrs @ 6%)
C_1	=	454 grams per pound (conversion factor, grams to pounds)
$/lb.	=	Dollars per pound of NOx emissions reductions

Points are assigned to each project based on the ratio of the annualized cost to the annualized NOx emissions reductions. <u>*Table 4*</u> provides the scoring ranges for this evaluation criterion.

<u>Table 4</u>

Air Quality / Energy Conservation Rating

$ / Lb. Of NOx Reductions	Score
> 100.0	0 Points
50.0 - 99.99	3 Points
10.00 - 49.99	5 Points
5.00 - 9.99	7 Points
< 4.99	10 Points

Sustainable Development/ Redevelopment/ "Smart Growth" Rating

Each project submittal is evaluated with respect to encouraging regional sustainable development or "smart growth" patterns (i.e. densification of the urban core counties) or redevelopment of distressed areas. There is not a sliding scale of points available for this criterion. Each project either receives the full 10 points or receives a zero. A project located within a census block classified as "Distressed" or "Under-Utilized" as defined in the Dallas County Tax Abatement Policy receives the full 10 points; all other projects receive a zero.

The aforementioned policy defines a "Distressed" area as a census block whose median family income is less than or equal to 150% of the poverty level for a Dallas area family of four or a census block contained within a federally or state-designated enterprise zone.

An "under-utilized" area is a census block that meets three of following five criteria:

1) *Low population growth* (percentage change in population that is less than the County average for 1980-1995)
2) *Low employment growth* (percentage change in employment that is less than the County average for 1990-1995)
3) *Low traffic congestion* (roadways where, in 1995, no more than 30% of lane miles exceeded free-flow traffic levels during peak hours)
4) *Low property values* (median value of owner-occupied structure is no greater than 50% of the County median)
5) *Predominantly low/moderate income population* (at least 51% of population earns less than 80% of the Dallas area median household income)

For census blocks that are at least two-thirds (2/3) undeveloped, only one of the five criteria listed above need to be met to qualify as "under-utilized."

Intermodal / Multimodal / Social Mobility Rating

Each project submitted for funding receives a score based either on its ability to involve more than a single mode of travel or its long-term economic development potential that could benefit the community. There is not a sliding scale of points available for this criterion. Each project either receives the full 10 points or receives a zero. There are four separate elements that comprise this scoring criteria and a project that addresses any one of these elements receives the full 10 points. These four elements are:

- <u>Intermodal Project</u> - A project that provides for the interaction of two or more transportation modes in a given area and which promotes the efficient movement and transfer of people or goods.
- <u>Multimodal Project</u> - A project that facilitates non-SOV (single occupant vehicle)modes of transportation.
- <u>Social Mobility Project</u> - A project that provides transportation services to individuals or groups who need some form of transportation due to an inability to utilize existing forms of transportation. This can include services to the elderly and disabled or economically disadvantaged individuals.
- <u>Infrastructure Investment Project</u> - A capital project with a likelihood of producing long-term economic benefits as opposed to an operational project which only provides direct benefits for a given short time period.

Special Case Rating Methodology

<u>Special Case #1</u> - If all or part of a roadway consisted of a new roadway, then it was not possible to calculate a Speed Delay Rating, a Benefit-Cost Ratio Rating, or an Air Quality Rating. In these cases, the Speed Delay Rating, the Benefit-Cost Ratio Rating, and the Air Quality Rating are all given zero points, and the maximum points for the Traffic Volume Rating are increased to 40. This is accomplished by multiplying the Traffic Volume Rating by four.

Special Case #2 - In certain situations, the Benefit-Cost Ratio may be misleading because the traffic induced by the capacity improvement was so great that the resulting congestion was higher than without the improvement. This signifies that the project is highly warranted. Projects falling under the Special Case #2 category receive zero points for the Benefit-Cost Ratio Rating, and the maximum allowable points for the Traffic Volume Rating is increased to 20. This is accomplished by multiplying the points assigned to the Traffic Volume Rating by two.

Special Case #3 - The criteria which use percent change as a basis for scoring, Traffic Volume Growth Rating and Travel Desire Rating, could be misleading if the absolute value of the traffic volumes is less than 5,000 in the year 2020. To avoid overrating these projects, the maximum points available for the Traffic Volume Growth Rating Criteria and the Travel Desire Rating is reduced to five for each rating element. This is accomplished by dividing the score for these two criteria by two.

LOCAL COST PARTICIPATION MULTIPLIER

In order to aide in the successful implementation of the Dallas County CMIP, it is imperative to accept only those projects for funding that have a strong commitment from all the stakeholders. One strong indicator of this commitment is the value of resources being contributed. In order to reward those projects with strong commitments, a multiplier based on the value of the local commitment (as a percentage of the total project value) is applied to the aggregate scores. This multiplier is equal to 1 plus the percent of local match, expressed as a decimal. Thus, if a City commits to a match of 50 percent of a project's value, that project's aggregate score will be multiplied by 1.50 in determining the final score. For a match of 20%, the multiplier is 1.20.

As the financial resources of all possible stakeholders are not equal, said multiplier may be considered to be inherently biased against those possible stakeholders with limited resources. Therefore, in order to mitigate this perception of inherent bias, bonus points are assigned to those cities where 60% of the land area falls in census blocks defined as "Distressed" or 51%

Low/Moderate Income. This bonus consists of adding 0.3 to the multiplier for any project submitted by a city qualifying for the bonus. For example, a the multiplier for a project submitted by a qualifying city contributing 20% of the total cost of the project is 1.50 (1.20 plus 0.30), the same multiplier applied to a project for a non-qualifying city contributing 50%.

Example 1.

Projects for Cities A, B, C, and D all finish with aggregate scores of 80. Cities A, B, C, and D agree to contribute 50%, 20%, 0%, and 20%, respectively, of the cost of the project. City D qualifies for the 60% local match multiplier bonus.

The multiplier for the four projects are as follows:
City A – 1.50
City B – 1.20
City C – 1.00
City D – 1.50

The final point totals for the four projects, computed by multiplying the aggregate total by the multiplier, are as follows:

City A – 120.0
City B – 96.0
City C – 80.0
City D – 120.0

Example 2.

City Q is a qualifying city and contributes 20% of the project cost. Q's project finishes with an aggregate score of 70 and a total score 105.0. City R's project finishes with an aggregate score of 100, but since R is not willing to commit local resources (and is non-qualifying), the project finishes with a total score of 100.0, below Q's. So does City S's project with a total score of 102.0, which finished with a higher aggregate score of 85 but was supported with a 20% local commitment (S is a non-qualifying city) resulting in a multiplier of 1.20 compared to Q's 1.50.

CONCLUSION

The holistic methodology was embraced enthusiastically not only by the Dallas County Commissioners Court, but by local jurisdictions as well. It was felt by all parties involved that the holistic methodology addressed the bias concerns raised about the implementation of the previous bond program in which most of the projects were capacity improvement projects in the more affluent areas of the county. In addition, the new methodology gave all of the jurisdictions of Dallas County a common set of criteria for project evaluation, which aided in the selection by the cities of projects to be considered, as the city staffs were able to use these criteria to determine the strength of proposed submittals, and focus their resources on those projects that have a greater chance of success.