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ACCESS MANAGEMENT IMPLEMENTATION IN KENTUCKY TECHNICAL SUPPORT DOCUMENT AND STATUS REPORT



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Research Report KTC-08-05/SPR290-05-2F

**Access Management Implementation in Kentucky
Technical Support Document and Status Report**

by

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Kentucky Transportation Cabinet
Commonwealth of Kentucky

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16. Abstract This report describes the efforts of the Kentucky Transportation Cabinet's Access Management Implementation Task Force. The task force was established in May 2004 and was charged with the responsibility of reviewing and refining the recommendations in the <i>Access Management for Kentucky</i> research study for the purpose of implementing a comprehensive access management program for the state of Kentucky. The Kentucky Transportation Center provided technical and administrative support to the task force. This report provides documentation of the information considered by the task force, the deliberations over that information, and the decisions and recommendations made by the task force. Although a decision was made to suspend task force initiatives prior to full-scale implementation of a formal program, the information contained in this report should prove to be a valuable resource for a resumption of implementation efforts when conditions are deemed to be appropriate.			
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EXECUTIVE SUMMARY

Access management is defined as the “systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway” (1). The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system. Access management principles stress traffic flow and mobility for higher-class roadways and access to adjoining land uses for lower-class roadways and place an emphasis on safety for all classes of roads. An effective access management program can reduce crashes as much as 50 percent, increase roadway capacity by 23 to 45 percent, and reduce travel time and delay as much as 40 to 60 percent (2). For highway agencies, access management can serve as a strategy to save highway improvement dollars by preserving the function and capacity of roadways and thereby extending the useful life of those roadways.

All state highway agencies exercise some control over highway access, but traditionally these programs have focused primarily on driveway design and location. In Kentucky, management of highway access (at the state level) is currently limited to the Transportation Cabinet’s case-by-case access permit review process for state-maintained routes and to negotiated access spacing improvements that are incorporated in the design of major highway improvement projects. Nationwide, approximately 26 states have implemented comprehensive access management programs in recent years.

In 2002 the Kentucky Transportation Cabinet (KYTC) and the Kentucky Transportation Center, in cooperation with the Federal Highway Administration (FHWA), initiated an access management research study. The timing of this effort coincided with the insertion of a goal in the KYTC/FHWA Joint Strategic Plan for 2004-2008 (Paths to Progress) to “Develop and implement access management related guidance by June 30, 2004”. The objective of this research was to develop the foundation for an access management program in Kentucky. The study reviewed practices in other states that have established access management programs and evaluated existing practices within Kentucky for controlling and permitting access on highways and streets within the state. The report *Access Management for Kentucky* provided pertinent background information and made recommendations related to the basic components of a comprehensive access management program – an access management highway classification system, access spacing and design standards, and a variance process. The report also included an implementation plan for an access management program.

A key element of the implementation plan was the formation of an Access Management Implementation Task Force. The task force was charged with the responsibility of reviewing and refining the recommendations in the *Access Management for Kentucky* research report and with working out the many details required to formally implement an access management program. The sections below encapsulate the recommendations made by the task force related to the basic components of an access management program and summarize the potential benefits of the proposed program, current activities, and suggested future steps.

Roadway Classification

Most of the systems developed by other states have utilized existing functional classification designations as the basis for their roadway classification system. The rationale for this approach is that allowable access should be correlated with a roadway's purpose and importance. Additional indicators that have been used by other states include traffic volume, speed, geometric features (number of lanes and median type), and land use. The task force adopted the approach recommended by the *Access Management for Kentucky* study and decided to use functional classification in conjunction with traffic volume and posted speed limit.

The proposed access classification system was developed in two stages. First, each state-maintained roadway segment was assigned to one of the new access management classes using functional classification, traffic volume, and posted speed limit data contained in the Cabinet's Highway Information System (HIS) database and computerized procedures. The initial classification assignments were then refined based on GIS mapping and a manual review process. Adjustments to the initial classifications were made to incorporate considerations such as adjacent land use and planned highway improvements that are not in the HIS database and to ensure appropriate system continuity and logical break points. The details of this process are described in Chapter 4.

Access Spacing

Every access point introduces conflicts and friction into the traffic stream. As the number of conflicts increases the potential for crashes becomes higher, and the resulting friction translates into higher crash rates, reduced travel speeds, and increased road user delays. To address these issues, access management programs establish minimum access spacing standards for each access classification that are consistent with the intended function of the roadways within each class. Access management spacing standards must also involve a compromise between engineering principles and the access needs of the surrounding land use. In many cases it will not be practical to provide the desirable access separation distances for driver decisions and vehicle maneuvers. The guiding principle for the task force was that the standards selected should maximize access opportunities while remaining as faithful as possible to the most critical operational and safety principles. To this end, Kentucky's recommended standards incorporate two access type categories. This approach allows significantly reduced spacings in certain negligible impact situations (residential driveways and farm entrances). The details of the access management spacing standards that have been recommended for Kentucky can be found in Chapter 5.

It is important to note that the proposed access management standards are not intended to be applied retroactively. They will apply to requests for new access and to changes in existing access. Legal access that exists at the effective date of the new access management policy would be allowed to continue, subject to change in use regulations. Further, in cases where the Cabinet formally negotiates access modifications with property owners in conjunction with a highway improvement project, it is expected that such negotiations would take precedence over the spacing standards.

In addition to the recommended access spacing distances, a set of recommended practices that have the potential to improve traffic flow and increase safety have also been developed. These practices include:

- An examination of the recommended spacing distances in conjunction with sight distance requirements, which should take precedence over the recommended distances;
- An evaluation of existing signals along reconstructed roadways to determine whether their presence is still warranted and removal of unnecessary and/or unwarranted signals;
- Encouraging corner properties with frontage on roadways with different access classes to obtain access via the lower class roadway and provision of a nontraversable median to eliminate left-turns if access must be provided along the higher class roadway;
- Locating access to corner properties as far from the intersection as feasible;
- Consolidation of driveways to adjacent properties whenever feasible;
- Elimination of left-turn access movements across turn lanes or within the limits of regularly forming traffic queues;
- Completion of detailed studies for driveway permits within the influence area of major intersections to ensure minimum disruption of operations at the intersection; and
- Provision of access for outparcels at large developments from within the site and prohibition of direct access to outparcel developments.

Variance and Appeals Process

Some flexibility is required when administering access management regulations. In conjunction with the standards that are adopted for access spacing and design, a variance or deviation process is needed to allow for a lesser spacing where special or unique conditions make application of the minimum standards inappropriate. Allowing for variances in access management standards requires that these situations be handled in a consistent manner, although deviations may be categorized as minor or major in character, with the latter requiring a more extensive review. A two-level review process is proposed for applications that are in conflict with the access standards.

A *minor variance* would involve a minor deviation from the standards and a negligible impact on highway operations and safety. The consideration of requests for minor variances would be relatively straightforward. The basic test for favorable consideration would be proof of necessity and that there are no reasonable engineering or construction alternatives to provide access to the site which would meet, or be closer to compliance with, the standard. A *major variance* would involve a more significant deviation from the standards and the potential for significant impacts on highway operations and safety. The consideration of requests for major variances would require more extensive justification, analysis, and review. In addition to the basic test described above for minor variances, applicants for a major variance would have to prove that traffic operations and safety would not be degraded to an unacceptable level by proposed development and access plan or that the level of safety/operational performance would be comparable to that provided with full adherence to access management standards.

In addition to the variance process, an appeals process will be built into the administrative procedures for access management to assure “due process” for access applicants. In the practice of access permitting an appeal could arise when a permit or variance request is denied or if the Transportation Cabinet establishes a permit condition that is not acceptable to the applicant. This process would offer two levels for potential appeals prior to a property owner resorting to a judicial recourse. The first level would involve a review of the case by a Transportation Cabinet committee. An ensuing appeal of this committee’s decision would be addressed through Kentucky’s Administrative Hearing (KRS 13B) process. Any further appeal would be handled by District Court.

Benefits of Proposed Program

A separate study, described in Chapter 8, evaluated the capacity, safety and economic benefits that could be realized if the proposed access management plan was implemented. This analysis estimated potential reductions of over 20 percent in crashes and 32 percent in operational delay. Based upon these findings, it was estimated that proposed access management plan could save Kentucky road users approximately \$950 million per year. This hypothetical estimate of user cost savings indicates the general magnitude of benefits that could have been realized had an access management program been in place to control the access spacing (and resulting traffic control) that is typically found on today’s streets and roadways in Kentucky. As such, it provides a measure of the potential savings that could be realized if an access management program were implemented today, compared to the continuation of past access permitting practices.

Current Activities Related to Access Management

Key members of the task force have continued efforts through the date of this report to incorporate access management principles and task force recommendations into appropriate projects and the Cabinet’s daily practices. In addition, studies were undertaken to expand upon two issues - auxiliary lane warrants and traffic impact statement requirements - that surfaced during the access management implementation effort. A supporting effort has been the promotion of an Access Management Partnership Memorandum of Understanding between the Cabinet and local governments for three corridor studies that involved access management recommendations. More information on these activities, including a sample Memorandum of Understanding document, can be found in Chapter 9.

Conclusions and Suggested Future Steps

Although the decision was ultimately made to suspend task force initiatives prior to full-scale implementation of a formal access management program, this report should prove to be a valuable resource for an eventual resumption of implementation efforts. Chapter 10 discusses several steps that will be required to continue and complete the process, including the following: establishment of an implementation team; amendment of Kentucky Administrative Regulations (KARs) dealing with access control and encroachment permits; establishment of an organizational structure; development of an access management manual; finalization of the classification system; training; and public outreach.

1. Introduction

In 2002 the Kentucky Transportation Cabinet (KYTC) and the Kentucky Transportation Center, in cooperation with the Federal Highway Administration (FHWA), initiated an access management research study. The timing of this effort coincided with the insertion of a goal in the KYTC/FHWA Joint Strategic Plan for 2004-2008 (Paths to Progress) to “Develop and implement access management related guidance by June 30, 2004”. The objective of this research was to develop the foundation for an access management program in Kentucky. The study reviewed practices in other states that have established access management programs and evaluated existing practices within Kentucky for controlling and permitting access on highways and streets within the state. The report *Access Management for Kentucky* provided pertinent background information and made recommendations related to the basic components of a comprehensive access management program – an access management highway classification system, access spacing and design standards, and a variance process (3). The report also included an implementation plan for an access management program.

A key element of the implementation plan was the formation, by the Transportation Cabinet, of an Access Management Implementation Task Force. Following presentations of the findings and recommendations of the research study to the Cabinet’s upper management and senior engineers in October 2003 and March 2004, this task force was created, and the first meeting of the task force was held in May 2004. The Cabinet also established a Technical Support for Implementation of Access Management Plan project with the Kentucky Transportation Center to provide support for this effort. This report documents the activities and accomplishments of Kentucky’s Access Management Implementation Task Force from May 2004 through June 2007.

2. Background

The Implementation Plan chapter in the *Access Management for Kentucky* report identified the following steps for implementing an access management program in Kentucky:

1. Form access management implementation task force;
2. Develop and execute public involvement plan;
3. Finalize access spacing and design standards;
4. Initiate and oversee classification system assignments;
5. Develop procedure for classification revisions;
6. Develop Administrative Regulation;
7. Develop procedures for non-conforming access;
8. Develop variance process;
9. Define appeal process;
10. Define permitting process;
11. Define organizational structure and roles/responsibilities;
12. Develop access management manual; and
13. Conduct training.

As explained in the Introduction, the Transportation Cabinet formed an Access Management Implementation Task Force following presentations to the Cabinet's upper management and senior engineers in October 2003 and March 2004 (a new governor and administration took office in January 2004). The task force was charged with the responsibility of reviewing and refining the recommendations in the research report, including the implementation steps listed above, and with working out the many details required to formally implement an access management program. Task force representation included the following offices/functions within the Cabinet: State Highway Engineer's Office, Office of General Counsel, Division of Highway Design, Division of Traffic Operations, Division of Planning, Division of Multimodal Programs, Division of Right of Way and Utilities, Central Office Permits Branch, District Office level Preconstruction Branch, and District Office level Permitting function. The FHWA Kentucky Division Office monitored the process, and the Kentucky Transportation Center provided technical and administrative assistance. The task force was chaired initially by Ken Sperry, the Deputy State Highway Engineer for Preconstruction; this responsibility was subsequently reassigned to Chuck Knowles, the Deputy State Highway Engineer for System Preservation and Operations. Brent Sweger from the Division of Multimodal Programs (Planning) served as the vice-chairman. The task force met a total of 15 times between May 2004 and August 2006. In addition, numerous task specific sub-group meetings were held during this period. Although the decision was ultimately made to suspend task force initiatives prior to full-scale implementation of a formal access management program, key members of the task force continued efforts through the date of this report to incorporate access management principles and task force recommendations into appropriate projects and the Cabinet's daily practices.

3. Report Purpose and Organization

The Access Management Implementation Task Force has laid a very solid foundation for the implementation of an access management program for the state of Kentucky. The decision to forgo formal program implementation was not due to dispute over any specifics of the proposed program; it was due to a management perspective that access management, in general, would be viewed as a punitive type program by some property owners and developers within the state and that current conditions were not suitable for undertaking a radical change in the manner in which the Cabinet controls highway access. This report should prove to be a valuable resource for a resumption of implementation efforts when conditions are deemed to be more suitable.

The purpose of this report is to provide a single-source documentation of the information considered by the task force, the deliberations over that information - including its applicability and appropriateness for Kentucky - and the decisions/recommendations made by the task force. Detailed summaries of each task force meeting that were prepared by the Transportation Center are included in Appendix A of this report; these summaries provide the primary means of documenting task force deliberations and decisions. The chapters that follow serve to consolidate and summarize information on the major components of the implementation effort: the access management classification system; recommended standards; variance and appeals processes; and executive briefings and outreach. In addition, chapters are included to document

the benefits of the proposed program, to summarize current activities related to access management, and to offer conclusions and suggested future steps.

4. Access Classification System

The core element of a comprehensive access management program is a roadway classification system. Classification is the process by which streets and highways are grouped into classes according to the character of service they are intended to provide. An Access Management Classification System was established for the purpose of assigning access spacing and design standards to different types of roadways based on the intended function of the roadway and, in particular, the priority placed on property access as opposed to through-traffic movement.

Most of the systems developed by other states have utilized the existing federal Functional Classification as the basis for their access classification system. The rationale for this approach is that the primary characteristic of each functional class definition is the relative priority placed on service to major traffic movements versus service to abutting land. Additional indicators that have been used by other states include traffic volume, speed, geometric features (number of lanes and median type), and land use. The *Access Management for Kentucky* research report recommended that functional classification be used in conjunction with traffic volume and posted speed limit for developing the initial access management classification system. Traffic volume and speed limit combinations are used to identify roadways where the access control for a given functional class could be increased or decreased. The logic is that roadways with high volumes and speed limits could warrant a higher level of access control than roadways within the same functional class with lower volumes and speed limits. Similarly, roadways with low volumes and speed limits could operate acceptably with a lower level of access management control than roads with higher volumes and speed limits within the same functional class.

The parameters used for the initial classification system are presented in Table 1. This table illustrates the use of functional classification, traffic volume, and posted speed limit and the corresponding threshold values to determine the initial access classification assignments. The system uses a set of four classes each for urban and rural roadways that do not already have full control of access. (Interstates, parkways and other freeways that have full access control are treated separately.) The initial correspondence between functional class and these categories is: I - Principal Arterial, II - Minor Arterial, III - Collector (both Major and Minor in rural areas), and IV - Local. A speed limit of 45 mph is used in conjunction with the traffic volume ranges shown in the table to identify those roadway segments where functional class designations should be adjusted for access management purposes.

Table 1. Access Management Classification Parameters

	Rural			Urban				
Principal Arterial	Volume			Volume				
	Speed	<5,000	≥5,000	Speed	<10,000	≥10,000		
	≥45	I	I	≥45	I	I		
	<45	II	I	<45	II	I		
Minor Arterial	Volume			Volume				
	Speed	<2,500	≥2,500	≥5,000	Speed	<5,000	≥5,000	≥10,000
	≥45	II	II	I	≥45	II	II	I
	<45	III	II	II	<45	III	II	II
Collector	Volume			Volume				
	Speed	<2,500	≥2,500	Speed	<5,000	≥5,000		
	≥45	III	II	≥45	III	II		
	<45	III	III	<45	III	III		
Local	All speeds & volumes		IV	All speeds & volumes		IV		

The recommended classification strategy also included minimum section lengths for which the access management classification along a given route should not be allowed to change. In recognition of the fact that it would be undesirable for the classification of a route to change frequently or over short intervals, distances of 0.5 mile for urban areas and 1.0 mile for rural areas were recommended as the minimum section lengths. However, even with these minimums set, it was understood that it would typically be desirable to maintain system continuity over much longer distances.

It was recommended that the proposed access classification system be implemented in two stages. First, each state-maintained roadway segment would be assigned to one of the new classes by a computerized procedure using functional class, traffic volume, and posted speed limit data contained in the Cabinet’s Highway Information System (HIS) database. The initial classification assignments would then be refined based on GIS mapping and a manual review process. The research group recognized that adjustments to the initial classifications would be needed in numerous situations where factors other than functional classification, traffic volume, and posted speed (such as surrounding land use or roadway geometry) indicated that a higher or lower classification would be more appropriate for access management purposes. Refinement would also be needed for certain route segments from a system continuity standpoint.

After considering case study examples illustrating how specific roadways would be classified for access management purposes, the spacing standards that would result from this classification, and how the standards would impact land use that currently exists along the roads and changes in land use that would likely occur in the future, the Access Management

Implementation Task Force approved the recommended classification strategy and directed the Transportation Center to develop computer programming to assign the initial classifications.

A complicating factor in the development of the classification algorithms was the large number of short sections in the dataset extracted from the HIS database. As noted above, minimum section lengths over which a route's access management classification should not be allowed to change were set at 0.5 and 1.0 mile for urban and rural routes, respectively. Of the approximate 17,000 segments contained in the highway inventory dataset (after interstates, parkways, and other routes with full control of access were removed), over 8,000 were shorter than the appropriate threshold and were flagged as "short sections". This problem was overcome to a large extent by logic checks built into the program that examined the classification on either side of a short section and combined like-classed segments until the threshold was exceeded. Where this could not be done, the short-section flag was retained and the appropriate classification was determined during the manual review process. The access management classification algorithm can be found in Appendix B. System mileage, functional classification, and the results of the initial classification process are summarized in Table 2, below.

Table 2. Access Classification - Preliminary Mileage Summaries

	<u>Miles</u>	<u>Percent</u>
Total System (Sept. 2004)	27,487.163	100.00%
<u>Full Control of Access</u>		
Interstates	762.388	2.77%
Parkways	643.419	2.34%
Other Freeways	40.299	0.15%
Total	1,446.106	
<u>Subject to Access Mgmt</u>		
Rural	23,897.429	86.94%
Urban	2,143.628	7.80%
Total	26,041.057	

Table 2. (Continued)

Functional Classification Breakdown

<u>Rural</u>	<u>Miles</u>	<u>Percent</u>
02 - Principal Arterial	1,690.669	7.07%
06 - Minor Arterial	1,740.106	7.28%
07 - Major Collector	6,103.102	25.54%
08 - Minor Collector	8,933.065	37.38%
09 - Local	5,430.487	22.72%
Total	23,897.429	100.00%

<u>Urban</u>		
12 - Freeway/Expressway	1.122	0.05%
14 - Principal Arterial	762.891	35.59%
16 - Minor Arterial	820.866	38.29%
17 - Collector	409.170	19.09%
19 - Local	149.579	6.98%
Total	2,143.628	100.00%

Access Management Classification Breakdown

R1 - Rural I	2,210.180	9.25%
R2 - Rural II	3,056.255	12.79%
R3 - Rural III	13,200.507	55.24%
R4 - Rural IV	5,430.487	22.72%
Total	23,897.429	100.00%

U1 - Urban I	898.116	41.90%
U2 - Urban II	685.886	32.00%
U3 - Urban III	410.047	19.13%
U4 - Urban IV	149.579	6.98%
Total	2,143.628	100.00%

Following computer assignment of the initial data-determined classifications, the task force initiated the manual review process. District 4 was chosen to test the feasibility of the task and for developing the materials that would be needed. Guidelines for review and revision were developed along with GIS maps and supporting datasets. A small group of District staff was assembled and, following a training session, this group reviewed each county within the District. The group established a regular meeting schedule and spent about two hours on each county over the course of about 5 weeks. The review group found that the vast majority of the computer assignments were logical and reasonable and recommended changes on only about 5% of the sections. The recommended changes, which included both downgrades and upgrades, were primarily for route continuity purposes or to establish a more logical point for a change in class. It was reported that the most significant dilemma was deciding on the proper treatment of the main route through small towns. Following this successful demonstration of the classification methodology and approach, the Commissioner of Highways (in December 2005) directed that each District Office establish a team for this task (see Appendix C). It was suggested that these teams be made up of persons from the planning, permits, and traffic operations functions (several Districts also added a member from the design function). The KYTC Division of Planning prepared county and city level GIS maps of the preliminary classification system, and the Transportation Center was directed to develop refined guidelines (see Appendix C) and provide training. This training was conducted for each District between December 2005 and April 2006, and all reviews were completed by August 2006 – except for District 11, which did not complete the review. A summary of the recommended changes are presented in the Table 3, below. Overall, on a statewide basis (excluding D.11), changes in access management classification were recommended for 18.6% of the segments, which amounts to 12.3% of the total system mileage. A tabulation of the proposed access management classification system, by segment, would be too extensive to include in this report. This information can be found by contacting the Cabinet’s Division of Planning.

Table 3. District Review of Preliminary Access Classification System

District	Segments			Route Miles		
	Total	Changed	Percent	Total	Changed	Percent
1	1,731	448	25.9	2,796	433	15.5
2	2,081	953	45.8	3,306	1,243	37.6
3	1,408	241	17.1	2,440	318	13.0
4	1,668	94	5.6	2,900	41	1.4
5	1,573	153	9.7	1,761	96	5.5
6	1,460	273	18.7	1,921	179	9.3
7	1,783	206	11.6	2,157	155	7.2
8	1,300	167	12.8	2,360	126	5.3
9	1,295	218	16.8	2,007	168	8.4
10	965	161	16.7	1,834	155	8.5
11						
12	1,089	129	11.8	1,878	193	10.3
All	16,353	3,043	18.6	25,361	3,108	12.3

5. Access Management Standards

Access spacing standards are an integral component of access management. Access management programs establish minimum access spacing standards for each access classification that are consistent with the intended function of the roadways within the respective classes. Kentucky's program also incorporates two access type categories and allows significantly reduced spacings in certain situations for residential driveways (to three or fewer dwellings) and farm entrances. This chapter provides an overview of the process that the Access Management Implementation Task Force followed and presents the access management spacing standards that have been recommended for Kentucky. Detailed summaries of each task force meeting are included Chapter 4 of this report and provide the primary means of documenting task force deliberations and decisions.

The standards development process began with the preliminary standards proposed in the *Access Management for Kentucky* report. This report contains a set of proposed standards for interchange spacing, signalized intersection spacing, unsignalized intersection (including driveways) spacing, median opening spacing, corner clearance, and interchange area access spacing. These preliminary standards resulted primarily from an assimilation of the practices of other states that had developed access management programs. The task force's charge was to review each of the proposed standards and either formally accept or adjust as deemed necessary for application in Kentucky. During this process, which covered one year (from October, 2004 to October, 2005) and 10 task force meetings (Meetings 5 - 14), each standard received extensive discussion. The practical experiences of the task force members had a significant influence on these discussions, and new research findings published after completion of the *Access Management for Kentucky* report were included in the deliberations. In general, the task force considered one type or set of standards at a time, deliberated until a decision was reached, and then moved to the next type. However, as the group learned and refined its thinking about how the standards should work, it frequently went back and made adjustments to the standards that had been considered before. At the end of the process the standards were overlaid and additional adjustments were made for consistency and to ensure that they fit together in a logical fashion. At each step the task force was mindful of the following guiding principle:

Access management involves a compromise between engineering principles and the access needs of the surrounding land use. In many cases it will not be practical to provide the desirable separation distances for driver decision-making and vehicle maneuvering. The standards selected should maximize access opportunities while remaining as faithful as possible to the most critical operational and safety principles.

In particular, this guiding principle led to a rather innovative approach involving the incorporation of land use (or access) type into the standards - and significantly reduced spacing for certain negligible impact situations.

It should be understood that the access management standards are not intended to be applied retroactively. They would be applied to requests for new access and to changes in existing access. Legal access that exists at the effective date of a new access management policy would be allowed to continue, subject to change in use regulations. Further, in cases where the

Cabinet formally negotiates access modifications with property owners in conjunction with a highway improvement project, it is expected that such negotiations would take precedence over the spacing standards.

In addition to the recommended access spacing distances, a set of recommended practices that have the potential to improve traffic flow and increase safety have also been developed. These practices include:

- An examination of the spacing distances in conjunction with sight distance requirements, which should take precedence over the recommended distances in situations where sight distance is restricted;
- An evaluation of existing signals along reconstructed roadways to determine whether their presence is still warranted and removal of unnecessary and/or unwarranted signals;
- Encouraging corner properties with frontage on roadways with different access classes to obtain access via the lower class roadway and provision of a nontraversable median to eliminate left-turns if access must be provided along the higher class roadway;
- Locating access to corner properties as far from the intersection as feasible;
- Consolidation of driveways to adjacent properties whenever feasible;
- Elimination of left-turn access movements across turn lanes or within the limits of regularly forming traffic queues;
- Completion of detailed studies for driveway permits within the influence area of major intersections to ensure minimum disruption of operations at the intersection; and
- Provision of access for outparcels at large developments from within the site and prohibition of direct access to outparcel developments.

5.1 Proposed Standards

Kentucky's Access Management Program includes standards for the following types of access management controls:

- Interchange Spacing – See page 14, Table 4
- Traffic Signal Spacing – page 14, Table 5
- Median Type – page 15, Table 6 and Appendix D
- Median Opening Spacing – page 16, Table 7
- Unsignalized Intersection (Driveway) Spacing – page 17, Table 8
- Corner Clearance – page 18, Table 9
- Interchange Area Spacing – page 19, Table 10

Spacing distances and notes associated with each control type are shown in the tables that follow. Unless indicated otherwise, all distances in these tables are given in feet. It was decided early in the development of Kentucky's Access Management Program that spacing standards should be in fractions and multiples of 600 ft. and 1,200 ft. because of the legacy of Kentucky's partial control of access regulation.

Diagrams illustrating how the spacing standards for traffic signals, median openings, and driveways fit together along a roadway section are shown on pages 20 and 21.

Table 4. Freeway Interchange Spacing Standards

Access Classification	Interchange Spacing Standard
Freeway – U	1 mile
Freeway – R	3 miles

Note: For new interchanges or interchange modifications on the Interstate Highway System preparation of a justification study and approval by the Federal Highway Administration are required.

Commentary: These standards align with the AASHTO Interstate Policy.

Table 5. Signalized Intersection Spacing Standards

Access Classification	Signalized Intersection Spacing
Freeway – U	NA
Freeway – R	NA
Urban I	2,400
Urban II	2,400
Urban III	1,200
Urban IV	1,200
Rural I	2,400
Rural II	2,400
Rural III	1,800
Rural IV	1,200

Commentary: The signal spacing of approximately ½ mile spacing on all Class 1 & 2 roads is to ensure adequate bi-directional signal progression.

Table 6. Median Type Standards

Access Classification	Preferred Median Type*
Freeway – U	Nontraversable
Freeway – R	Nontraversable
Urban I	Nontraversable
Urban II	Nontraversable (multilane facility) TWLTL (2-lane facility)
Urban III	TWLTL (typical) Nontraversable (high control situations)
Urban IV	NA
Rural I	Nontraversable Undivided w/Left Turn (2-lane facility) TWLTL (suburban environment)
Rural II	Nontraversable Undivided w/Left Turn (2-lane facility) TWLTL (suburban environment)
Rural III	NA
Rural IV	NA

* Median types listed provide general guidance for typical routes within each class. Refer to the detailed Median Type Guidelines listed below for more specific guidance for a particular situation.

Median Type Guidelines

Individual left-turn lanes recommended for:

- Locations where left-turn volume exceeds warrant (to be determined), and
- Access point density ≤ 10 ap/mi (access points per mile)

TWLTL generally appropriate for:

- Urban/suburban 3-lane roadways with:
 - projected ADT < 17,000
 - access point density > 10 ap/mi and < 85 ap/mi
 - left-turn volume < 150 vph
- Urban/suburban multi-lane roadways with:
 - projected ADT < 24,000
 - access point density > 10 ap/mi and < 85 ap/mi
 - left-turn volume < 100 vph

Nontraversable medians preferred for:

- All new multilane arterials
- Existing roadways where ADT, access density, and/or turning volumes exceed thresholds established above for TWLTLs
- Existing rural multilane arterials
- Crossroads in the vicinity of interchanges
- Multilane roadways with high pedestrian activity

Notes:

1. Traversable raised medians are not recommended since they neither facilitate left turns nor do they provide positive control over left turn movements.
2. If a project design team determines that a different median type is needed for safety or traffic operational reasons, a variance may be requested.

Table 7. Median Opening Spacing Standards

Access Classification	Median Opening Full	Median Opening Directional
Freeway – U	NA	NA
Freeway – R	NA	NA
Urban I	2,400	1,200
Urban II	2,400/1,200*	1,200/600*
Urban III	600	300
Urban IV	NA	NA
Rural I	2,400	1,200
Rural II	2,400	1,200
Rural III	900	450
Rural IV	NA	NA

* For roadways with an 85th percentile speed greater than or equal to 45mph, use larger values. For roadways with an 85th percentile speed less than or equal to 45 mph, the larger values should be utilized where feasible but the lower values may be applied, where necessary. Use of the lower values does not alter the 2,400 ft. minimum traffic signal spacing standard.

Notes:

Mid-block median openings (used for U-turns only) may be located 300 feet from an intersection at which left-turns are restricted if the following conditions are met:

- a. adequate sight distance;
- b. adequate space for accommodating the U-turn design vehicle;
- c. adequate space for incorporation of a “left-turn” auxiliary lane (including taper and storage); and
- d. there is no potential for use by drivers desiring to turn left from nearby driveways.

Commentary:

- For Class I, II and Urban Class III, full median opening standards are developed to align with the signal spacing standards with the exception noted above for Class 2 roadways.
- For Rural Class 3, full median opening is developed to be ½ of the signal spacing standard. Consecutive median openings will not be signalized.
- Typically, roads classified as Class 4 will not contain a median.

Table 8. Unsignalized Intersection Spacing Standards

Access Classification	Type A Access*	Type B Access**
Freeway – U	NA	NA
Freeway – R	NA	NA
Urban I	1,200/600 ***	300
Urban II	600	150
Urban III	300	150
Urban IV	150	100
Rural I	1,200	300
Rural II	600	300
Rural III	450	150
Rural IV	150	150

- * Type A Access - All commercial, industrial, and recreational uses; residential subdivision entrances; public roadways; and all other access not specified as Type B Access
- ** Type B Access - Single family residences; multiple-family residences (3 units or less); and farm/field entrances
- *** For roadways with an 85th percentile speed greater than 45mph use larger values. For roadways with an 85th percentile speed less than or equal to 45 mph, the larger values should be utilized where feasible but the lower values may be applied, where necessary.

Notes and Restrictions Applicable to Type B Access:

1. All other standards will apply according to the roadway classification.
2. Type B access spacing may be utilized only if alternative reasonable access meeting Type A standards is not feasible.
3. Change of land use from that previously permitted under Type B access to that classified as Type A requires a new permit and application of Type A standards.
4. Only one access allowed per parcel or for contiguous parcels under one ownership. Additional access points may be allowed only if they meet Type A standards and are deemed necessary for the convenience or welfare of the traveling public.
5. Type B access should not be allowed within the functional area of another intersection. No entrance shall be permitted within the limits of a turning lane.
6. Type B access shall not be permitted on routes designated as having “Partial Control” access.
7. When a median is present, Type B access will be limited to right turns only.
8. Unified access using cross access, combined entrances, backage roads and frontage roads is strongly encouraged.

Commentary:

- Corridor agreements for new or retrofit projects may result in different negotiated access spacing. Such agreements, signed by KYTC and appropriate local government(s) would take precedence over these standards.
- Project teams may still elect to implement Partial Control access for a new design project.

Table 9. Corner Clearance Standards

Access Classification	Type A Access	Type B Access
Freeway – U	NA	NA
Freeway – R	NA	NA
Urban I	1,200/600*	300
Urban II	600	150
Urban III	300	150
Urban IV	150	100
Rural I	1,200	300
Rural II	600	300
Rural III	450	150
Rural IV	150	150

* For roadways with an 85th percentile speed greater than 45mph, use 1,200 ft. upstream of intersection.

Notes:

1. In addition to the spacing standard for the appropriate roadway classification, requirements for adequate corner clearance include:
 - Driveways should not be permitted within the limits of turning or other auxiliary lanes in cases where the length of the auxiliary lane, including taper, is greater than the applicable spacing standard.
 - Driveways should not be permitted within the limits of regularly forming queues.
2. For corner properties, Type B corner clearance may only be applied along the roadway with lower access function, based on the access classifications of the intersecting routes. In cases where the access classifications are the same a determination of relative access function will be made by the Cabinet. For intersections of a local road or street with a state-maintained route, it is presumed that the local facility will have the lower access function.

Commentary: Requirements for corner clearance are necessary to insure that the functional area of the intersection is not impacted. Requests for access near important or congested intersections may require a detailed traffic engineering analysis to determine the intersection’s functional area.

Table 10. Interchange Area Spacing Standards (1)

Access Classification	Full Access Intersection (2)	Limited Access Connection (3)	Right-In/Right-Out Access Only (4)
Freeway – U	NA	NA	NA
Freeway – R	NA	NA	NA
Urban I	1,200/600*	300	300
Urban II	600	150	150
Urban III	300	150	150
Urban IV	150	100	100
Rural I	1,200	300	300
Rural II	600	300	300
Rural III	450	150	150
Rural IV	150	150	150

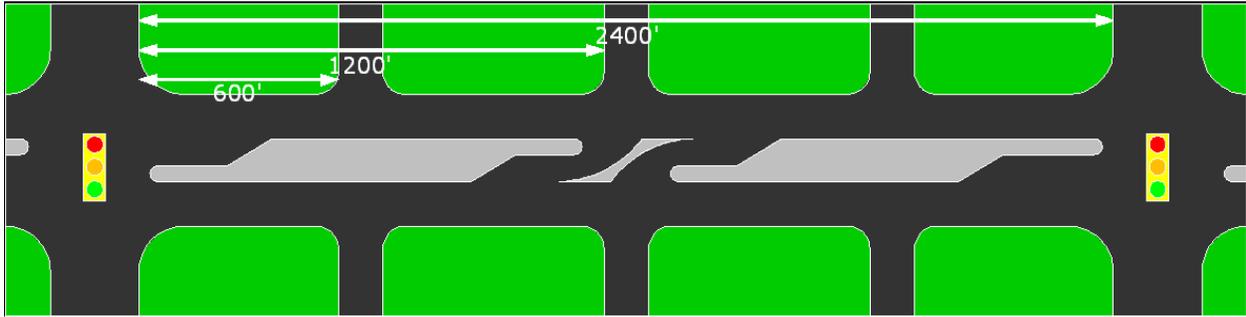
- (1) Spacing measured from ramp end of taper (end of radius if no taper) to access connection closest edge of pavement.
- (2) Distance to first four-way intersection. Beyond this point spacing standards based on crossroad access class apply.
- (3) Distance to first access connection limited to Right-In/Right-Out and Left-In movements. Applicable where left-turn movements restricted by median barrier with directional median opening.
- (4) Applicable where left-turn movements restricted by median barrier.

Notes:

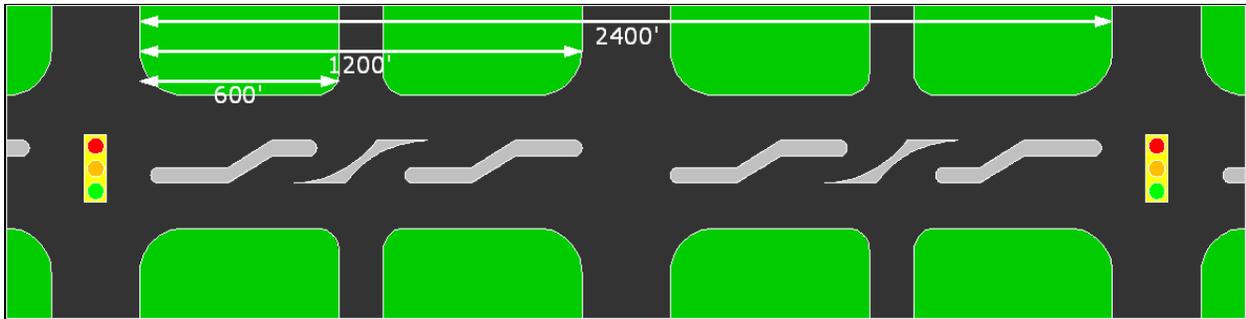
1. Spacing distances for Limited Access Connections apply only where adequate left-turn lanes can be physically accommodated.
2. Spacing distances for Limited Access Connections may be applied to unsignalized full movement connections if there is no possibility for access on opposite side.
3. Access connections shall not permitted within limits of ramp taper.
4. Access connections should not permitted within limits of auxiliary lane for downstream intersection.
5. Type B access spacing not permitted with between ramp and first Limited Access Connection.

Figure 1. Spacing Standards by Classification – Urban Classes

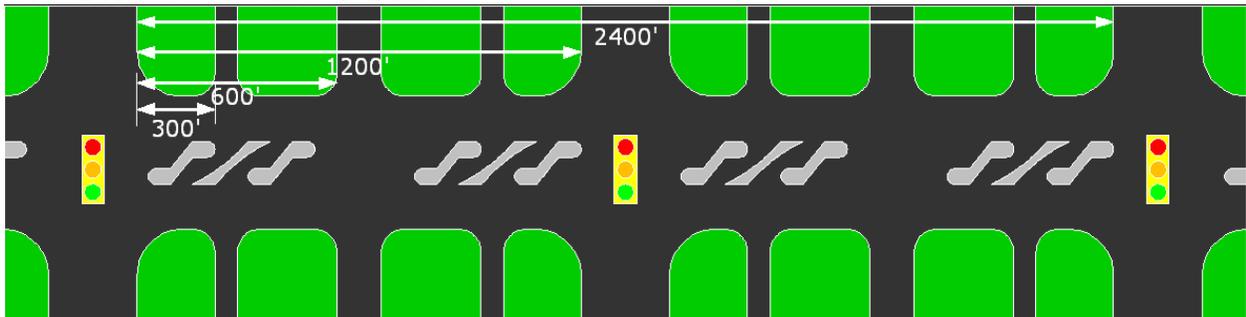
Urban Access Classification I



Urban Access Classification II



Urban Access Classification III



Urban Access Classification IV

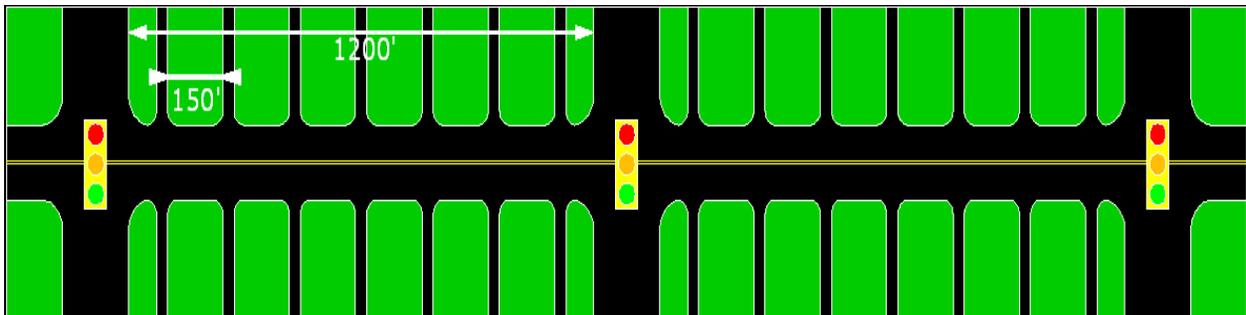
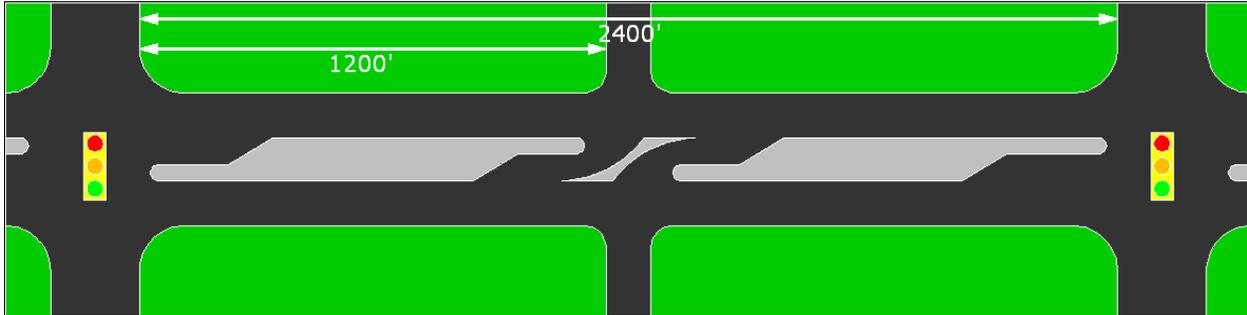
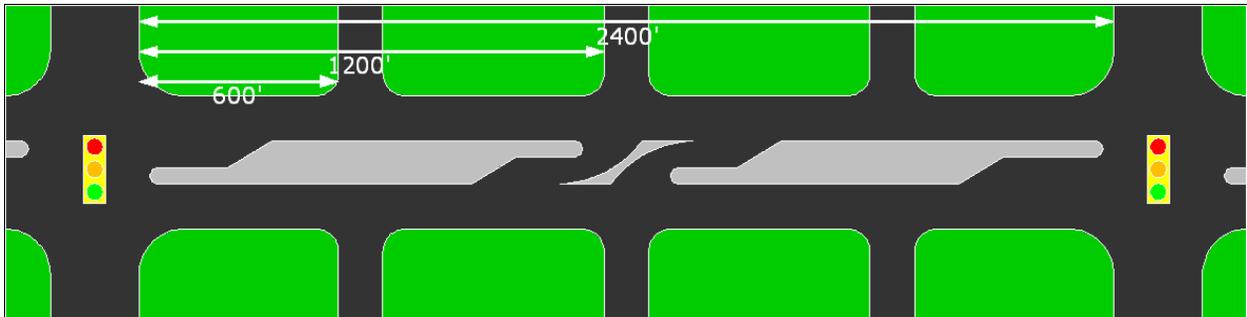


Figure 2. Spacing Standards by Classification – Rural Classes

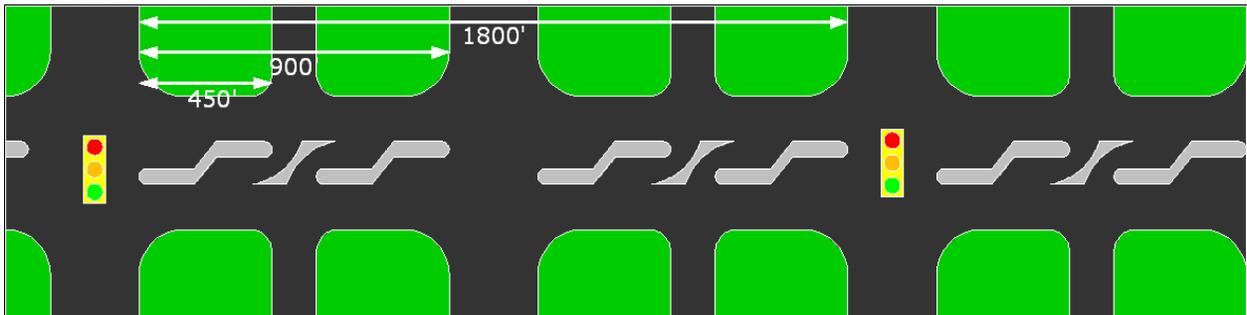
Rural Access Classification I



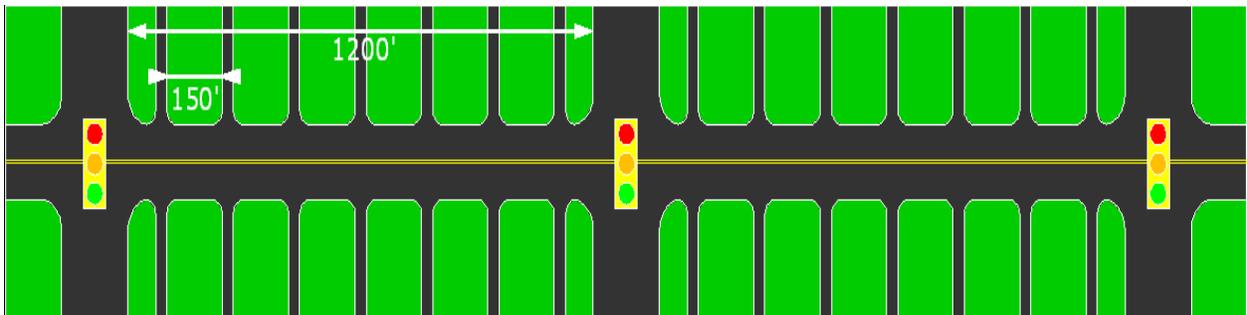
Rural Access Classification II



Rural Access Classification III



Rural Access Classification IV



6. Variance and Appeals Processes

It is widely understood that some flexibility is required when administering access management regulations. In conjunction with the standards that are adopted for access spacing and design, a variance or deviation process is needed to allow for a lesser spacing where special or unique conditions make application of the minimum standards inappropriate. The Implementation Task Force understood that the development of a fair and well-conceived variance process would be critical to Cabinet support for and public acceptance of an access management program. In addition to a variance process, an appeals process is needed to assure “due process” for access applicants.

Allowing for variances in access management standards requires that these situations be handled in a consistent manner, although deviations may be categorized as minor or major in character, with the latter requiring a more extensive review. The framework for a two-level variance review process was developed prior to suspension of the task force’s work. An overview of this process is given in the paragraph below. More details can be found in the sections of this report that summarize Meetings No. 13 and 14 of the Access Management Implementation Task Force.

A Minor Variance would involve a minor deviation from the standards and a negligible impact on highway operations and safety. The consideration of requests for minor variances would be relatively straightforward. The basic test for favorable consideration would be proof of necessity and that there are no reasonable engineering or construction alternatives to provide access to the site which would meet, or be closer to compliance with, the standard. A Major Variance would involve a more significant deviation from the standards and the potential for significant impacts on highway operations and safety. The consideration of requests for major variances would require more extensive justification, analysis, and review. In addition to the basic test described above for minor variances, applicants for a major variance would have to prove that traffic operations and safety would not be degraded to an unacceptable level by proposed development and access plan or that the level of safety/operational performance would be comparable to that provided with full adherence to access management standards.

In addition to the variance process, an appeals process should be built into the administrative procedures for access management to assure due process for access applicants. In the practice of access permitting an appeal could arise when a permit or variance request is denied or if the Transportation Cabinet establishes a permit condition that is not acceptable to the applicant. This process would offer two levels for potential appeals prior to a property owner resorting to a judicial recourse. The first level would involve a review of the case by a Transportation Cabinet committee. An ensuing appeal of this committee’s decision would be addressed through Kentucky’s Administrative Hearing (KRS 13B) process. Any further appeal would be handled by District Court.

7. Executive Briefings and Outreach

During the course of the task force's work to develop recommended policies and standards for Kentucky's access management program six sessions were held with top management within the Cabinet to gauge the level of management support, report on progress, and provide information on program details. Numerous sessions were also held with various staff and functional units within the Cabinet to exchange information and provide status updates. And, even though a decision was made to defer public/stakeholder involvement until the Cabinet was ready to undertake formal implementation steps, task force members did take advantage of available opportunities to share information about the program with stakeholder groups. This included presentations at state-level and regional conferences (Kentucky Association of Counties, Kentucky League of Cities, American Public Works Association - Kentucky Chapter, American Planning Association - Kentucky Chapter, Consulting Engineers Council, and Institute of Traffic Engineers) and to local governments and planning/public works agencies. In general, audience members at these sessions were familiar with the concept of access management and aware of national level initiatives and were very supportive of the development of a state-level program within Kentucky.

8. Benefits of Proposed Program

At the January 2005 executive briefing the KYTC Commissioner of Highways requested information on the benefits that would be expected from implementation of the proposed access management program. A research effort was undertaken by the Kentucky Transportation Center in July 2005 in response to this request.

This study evaluated the capacity, safety and economic benefits that could be realized if the proposed access management plan was implemented. The resulting *Quantification of the Benefits of Access Management for Kentucky* report (4) summarized the benefits of access management as determined by national research as well as benefits observed in limited Kentucky case study experience. In addition, the TRB Access Impact Calculator developed as a part of by NCHRP Report 420 (5), was used to evaluate the potential benefits of the proposed plan on a sample of Kentucky roadways. The results of this analysis were then extrapolated to the statewide system to estimate total annual savings in delay and crash reductions. Based upon this analysis, it was estimated that proposed access management plan could save Kentucky road users approximately \$950 million per year. This hypothetical estimate of user cost savings indicates the general magnitude of benefits that could have been realized had an access management program been in place to control the access spacing (and resulting traffic control) that is typically found on today's streets and roadways in Kentucky. As such, it provides a measure of the potential savings that could be realized if an access management program were implemented today, compared to the continuation of past access permitting practices.

The following sections were extracted from the executive summary of the *Quantification of Benefits* report:

The crash and delay reduction rates demonstrated on the sample sections were then applied to the statewide system, which produced the following results:

- A total statewide annual crash reduction of over 20 percent.
- A reduction of delay on the surface street system of 46 million hours per year with the largest delay savings on Urban Class I and II roadways.

Based on these figures a total cost savings of \$950 million per year is estimated. This includes \$240 million savings from a 21% reduction in surface street crashes, and a \$700 million savings from a 32 percent reduction in operational delay.

The estimated user cost savings indicate the general magnitude of benefits that would have been realized had an access management program been implemented before rapid urban development and growth took place. As such, it provides an evaluation of the potential savings that could be realized if an access management program is implemented today, compared to the continuation of past access permitting practices. Without the implementation of a statewide access management plan traffic signal and driveway access densities on Kentucky's roadways will continue to increase causing higher delays and increasing statewide crashes. The benefits identified above will be achieved by proactively managing future roadway access through a comprehensive statewide program and through efforts to improve current access spacing in conjunction with highway improvement projects. (4, page iv)

In addition to the exercise to quantify the benefits of Kentucky's proposed access management program, numerous discussions focusing on the benefits of access management, in general, took place during the implementation effort. The following table was prepared as a summary of those discussions.

Table 11. Access Management Benefits List

For Property/Business Owners

- Ensures that road in front of business will support the maximum number of vehicles (more potential customers) in the safest possible manner
- More convenient business/shopping experience for customers
- Improved access location/design and highway operations makes more land available for development (at higher densities) and ultimately raises property values
- Preserves (possibly enhances) market reach of business
- Improves image of area
- Future development/access decisions will not negatively impact corridor or access to site
- Preserves long-term viability of development
- Alternatives to access management (road widening or construction of bypass routes) could be very disruptive to business

For Customers

- Easier, quicker, safer access to destination
- Safe access with good traffic flow creates a better shopping experience

For Developers

- Rules are known
- Rules applied consistently to all
- Mechanism available to deal with unique or problem situations

For all Kentuckians

- Significant improvements in highway safety
- Significant improvements in highway operations (reduced delays)
- Good business practice by government

For KYTC

- Preserves function and capacity of highways
- Saves highway improvement dollars
- Improved access permitting practice

9. Current Activities Related to Access Management

Although the decision was ultimately made to suspend task force initiatives prior to full-scale implementation of a formal access management program, key members of the task force continued efforts through the date of this report to incorporate access management principles and task force recommendations into appropriate projects and the Cabinet's daily practices. In addition, studies have been undertaken to expand upon two issues - auxiliary lane warrants and traffic impact statement requirements - that surfaced during the access management implementation effort. A particularly noteworthy effort has been the promotion of an Access Management Partnership Memorandum of Understanding between the Cabinet and local governments for three corridor studies that involved access management recommendations. This chapter provides a summary of these activities.

9.1 Criteria for Design and Justification of Auxiliary Lanes

The need for a consistent process to identify when auxiliary turn lanes should be required in conjunction with new development proposals or included with the design of highway improvement projects was identified during the access management implementation effort. A research study to address these issues was undertaken in August 2006. The results of this study will be a set of warrants and standards for the provision and design of right-turn and left-turn auxiliary lanes. The availability of such warrants and standards will aide highway design, traffic engineering, and access permitting practices within Kentucky. In addition, the results of this study will be integrated into Kentucky's access management program as it develops in the future. It is also anticipated that the products of this study will be useful in providing justification for requiring and specifying developer-funded turn lane improvements which may be needed to mitigate the impacts of major traffic generating developments. A final report from this study is anticipated by June 2008.

9.2 Development of Traffic Impact Study Requirements

Traffic impact studies (TIS) are used to evaluate the impact of proposed development and access onto the public street system. KYTC currently does not have a policy identifying when a traffic impact study is required or how traffic impact studies are to be conducted. The Access Management Implementation Task Force developed preliminary TIS requirements as part of the access management variance request process. However, the recent changes to legislation dealing with partial control of access highways increased the anticipated need for traffic impact studies and the urgency for developing more detailed requirements. A task force subcommittee was formed in late 2006 to develop TIS requirements independent of the access management work for use by district permit engineers. The KYTC subcommittee was a multi-disciplinary team with representatives from central office and district permitting and traffic engineering functions as well as local planning and zoning. The subcommittee produced a draft set of TIS requirements in June, 2007. This was followed by a formal research project through the Kentucky Transportation Center to enhance certain aspects of the requirements related to traffic estimation procedures and forecasting methodologies. Additionally, a need for training of both KYTC and consultant personnel who will review and perform traffic impact studies was

identified as a significant implementation need. A final report from this study is anticipated by June 2008.

9.3 Access Management Partnership Memorandum of Understanding

The initial memorandum of understanding (MOU) was developed by the Access Management Implementation Task Force to follow up on the recommendations from the access management study that was done for the US 31W corridor in Hardin County by the Cabinet and the Radcliff-Elizabethtown Metropolitan Planning Organization. Basically, the MOU provides a mechanism to indicate approval and adoption of the study by KYTC, local planning and zoning, and local units of government, and it is a commitment to follow the plan outlined in the study unless all parties agree that deviation from the plan is in the best interests of the corridor or community. The MOU also serves as an agreement that the Cabinet and local P&Z will work cooperatively on development plan and access permit reviews within the corridor.

Over the last several months leading up to the date of this report, similar versions (same terms of agreement, different location and project specific information) were developed for two additional applications – the Dixie Highway Corridor Access Management Redevelopment Plan developed for Dixie Highway (US 25) in Northern Kentucky and the I-65/US 231 Interchange Study (which included an Access Management Plan) for Scottsville Road in Bowling Green. The MOU concept and document were reviewed and approved by the Cabinet’s Office of Legal Affairs, the State Highway Engineer, and the Commissioner of Highways. Likewise, discussions with local signatory agencies have been positive. Adoption is expected in all three cases in 2008. It is felt that the MOU could prove to be a very valuable tool for the Cabinet. Similar agreements could be used for other corridors where access management studies are done or where access management recommendations are included in corridor improvement studies having a broader scope. The MOU could also be used as a mechanism to prevent local developers and/or the Cabinet’s permitting activities from negating access improvements that get implemented in conjunction with highway improvement projects. A sample MOU follows in the next section.

9.3.1 Sample Access Management Partnership Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING US 31W Access Management Partnership

I. Parties: This Memorandum of Understanding (hereinafter referred to as “MOU”) is made and entered into by and between the Kentucky Transportation Cabinet (KYTC), Hardin County (County), the City of Elizabethtown and the City of Radcliff (Cities), and the Radcliff-Elizabethtown Metropolitan Planning Organization (MPO). In addition, the respective County and City Planning Commissions are recognized as accessory parties to this MOU in acknowledgement of the roles of those agencies in carrying out the responsibilities outlined herein.

II. Background: Highway route US 31W extends for 37.367 miles through Hardin County, Kentucky and passes through the Radcliff-Elizabethtown Urbanized Area, the Fort Knox Military Reservation, and rural areas within the county. The route is part of the National Highway System and the National Truck Network. In November 2006 the MPO completed the US 31W Access Management Study. This study was undertaken to seek feasible strategies to more effectively manage access along the route and thereby improve the safety and efficiency of the highway. The study was conducted through a collaborative effort between the MPO, the Kentucky Transportation Cabinet, local government agencies, business owners, and the public. A total of 17 strategies, programs, and projects were recommended for the US 31W study corridor.

III. Purpose: The purposes of this MOU are to:

- Establish a common understanding regarding the importance of US 31W for regional mobility;
- Provide for the mutual acceptance of the US 31W Access Management Study as a shared vision of the corridor and its deficiencies and needs;
- Establish a shared commitment to managing and improving the corridor to preserve safety and mobility (the objectives) in a manner that is consistent with the US 31W Access Management Study; and
- Provide a framework for multi-jurisdictional coordination and cooperation in development review and access permitting decisions that impact the corridor.

IV. Need: The policies, programmatic procedures, and funding actions required to implement the recommendations of the US 31W Access Management Study and in carrying out development reviews and related access permitting actions for the US 31W corridor transcend the resources, authority, and jurisdiction of any single agency or unit of government. In addition, actions taken at any point along the corridor have the potential to impact traffic conditions and travel times for the entire corridor. Therefore, coordination and cooperation are necessary between governmental entities to accomplish corridor management objectives. Since such coordination has occurred previously on only an informal and ad hoc basis, a mechanism is needed to formalize cooperation.

V. Roles/Responsibilities: The general roles and responsibilities of the parties with respect to this MOU are outlined below. Other than the partnerships created for managing access within the US 31W corridor, it is not intended that this MOU create any responsibility or duty of care that did not previously exist or alter any existing responsibility or duty of care.

KYTC

- Issuance of access permits or denial of access permit requests.
- Funding allocation and project management for implementation of State-responsible improvement projects.
- Coordination and cooperation with City and County planning agencies in review of development proposals, including location and design of access.

County and Cities (through the respective Planning and Zoning Commissions)

- Actions related to zoning and development proposals within the respective jurisdiction of each party.
- Coordination and cooperation with KYTC during the review of such proposals.
- Initiation of efforts to improve access spacing and/or design in conjunction with rezoning or redevelopment of existing properties.

MPO

- Development of Project Identification Forms for improvements and modifications recommended by the US 31W Access Management Study and incorporation of such projects into the MPO's Long Range Transportation Plan.
- Prioritization of such projects in relation to other identified projects within the metropolitan area.
- Incorporation of such projects utilizing federal highway funds into the MPO's Transportation Improvement Program.
- Periodic review and reassessment of the findings and recommendations of the US 31W Access Management Study and revision as necessary.

VI. Understandings: The following matters are understood and agreed upon by the parties to this MOU:

- US 31W is a vitally important highway to Hardin County and the surrounding region. The primary functional purpose of this highway is to carry large volumes of traffic with minimal delays. US 31W must also provide access to significant and extensive development including businesses, industries, medical facilities, public buildings, the Fort Knox Military Reservation, and homes and farms. However, to the extent feasible, this access should be provided in a manner that does not detract from the primary function of the highway or create safety problems.
- Continued growth within the region is leading to increasing travel demand in the corridor which, if unmanaged, could negatively affect mobility and safety for users of the highway.
- The report from the US 31W Access Management Study, attached hereto and incorporated by reference herein, is approved and accepted as a “Plan” for addressing traffic operational and safety issues related to highway access within the corridor.
- Diligent efforts, consistent with available resources and current priorities, will be made by all parties to implement the strategies, programs, and projects recommended in the Plan.
- Consideration of requests for new access points along the corridor will be coordinated between KYTC and the local governmental agency having jurisdiction. KYTC will not issue an access permit until subdivision and/or development plans have been approved.
- Development approval and access permitting decisions will be made in a manner that is consistent with and supportive of the Plan - unless it is agreed upon by all parties that a departure from the Plan is in the best interest of the corridor.
- As opportunities arise - through rezoning, redevelopment, change in use of existing properties, or highway construction - all feasible efforts will be made to improve access spacing and design in a manner that is consistent with the Plan.
- The access management standards proposed by the Kentucky Access Management Implementation Task Force and incorporated into the US 31W Access Management Study (Part VI) will be considered as interim guidelines until such time as standards are formally adopted by KYTC or the County/Cities.

VII. MOU/Plan Amendment: More detailed plans that may be developed during the design of improvement projects will be incorporated into the US 31W Access Management Plan. Revisions to the Plan may also result from periodic review and reassessment by the MPO. Amendments to the Plan or MOU may be requested by any party to the MOU and must be adopted by all parties.

VIII. Signatures:

Recommended for Approval By:

Name, Chief District Engineer
Kentucky Transportation Cabinet, District 4

Date _____

Name
Hardin County Planning and Development Commission

Date _____

Name
Elizabethtown Planning Commission

Date _____

Name
Radcliff Planning Commission

Date _____

Approved By:

Name
Kentucky Transportation Cabinet

Date _____

Name
Hardin County

Date _____

Name
City of Elizabethtown

Date _____

Name
City of Radcliff

Date _____

Name
Radcliff-Elizabethtown Metropolitan
Planning Organization

Date _____

10. Conclusions and Suggested Future Steps

The Access Management Implementation Task Force has laid a solid foundation for the eventual implementation of an access management program for the state of Kentucky. The purpose of this report is to provide a single-source documentation of the information considered by the task force, the deliberations over that information, and the decisions/recommendations made by the task force. This report should prove to be a valuable resource for an eventual resumption of implementation efforts. Such efforts should include the following steps.

10.1 Establish Implementation Team

The State Highway Engineer should designate a team to take primary responsibility for the actions listed within this chapter. The establishment of a formal Access Management Implementation Team (approximately five persons is recommended) would be important for two reasons. First, it would signify to team members and other KYTC staff a commitment to the effort and a plan to move forward. Second, it would designate responsibility to named individuals to carry through with the tasks.

10.2 Amend 603 KAR 5:120 Access Control of Highways

Currently, this Kentucky Administrative Regulation defines the categories of access control (“access by permit”, “partially controlled” and “full controlled”). It also defines the process for requesting access to a state-maintained roadway and the process for changing the type of access control on a roadway.

This KAR should be modified to reflect the program recommended by the Access Management Implementation Team, including the following major components:

- Classification system (10 total categories including freeways)
- Process to modify a roadway classification
- Reference to standards for each classification
- Rules for existing, non-conforming access
- Process for requesting access
- Access permit request review process
- Variance to standards definitions (Minor and Major)
- Variance to standards request and review processes
- Appeal process

The proper level of detail that would be needed for each component within the KAR would need to be determined. The preferred approach would be to include only basic information and requirements within the KAR and include supporting details in an *Access Management Manual*. This would allow changes to be made to program details as the program evolves without requiring an amendment to the regulation. The implementation team, with assistance from the Office of Legal Affairs, would make recommendations on the language of the draft KAR. The regulation could go into effect once the Secretary of Transportation approves the *Manual* with the required components.

10.3 Amend 603 KAR 5:150 Encroachment Permits

Currently, this regulation incorporates the Cabinet’s *Permits Manual* for defining the process to permit encroachment onto state highways. This KAR should be modified to either reference a new *Access Management Manual* or to stipulate that it applies only to encroachment activities not involving direct access.

10.4 Define Organizational Structure

Because access management crosses so many different organizational boundaries within the Cabinet, it is recommended that a “Manager” be established who either reports directly to the State Highway Engineer or has the authority to coordinate between offices and divisions. This person would also be responsible for providing training and coordinating outreach activities.

Other decisions regarding organization that needs to be made include:

- Keeper of the classification system (Recommended: Division of Planning)
- Make-up of the District Review Committee for Minor Variance Appeals & Major Variance Reviews (Recommended: Chief District Engineer and two merit managers)
- Make-up of Central Office Access Management Review Team for Major Variance Appeals (Recommended: State Highway Engineer and Directors of Divisions of Maintenance, Traffic Operations, Design and Planning - or designees)

10.5 Develop Access Management Manual

It is important to have a *KYTC Access Management Manual* that is used by all affected Offices and Highway Districts and Divisions including, but not limited to, Planning, Design, Traffic Operations, Maintenance, Legal Services and Governmental Relations. This would provide a means of ensuring consistent standards and processes for everyone to follow. Each office or division may then reference this *Manual* within their own guidance manual.

The *KYTC Access Management Manual* should address the following program components:

- Classification system and process for modification
- Spacing and design standards for each class
- Design guidelines (including medians, turning lanes, driveways, shared access, etc.)
- Process for requesting access to a state highway (including required documentation)
- Traffic Impact Study requirements
- Permit request review process
- Variance to standards - request and review processes
- Appeal process

Practically, there are two approaches to developing this manual. The first option would be to have the implementation team write it. The second option would be to have the implementation team contract and manage a consultant team that has experience with statewide access management programs. Benefits of the second approach would be that more resources could potentially be devoted to the effort with a resulting earlier completion, and a consultant team could bring in experience from other similar efforts and potentially fine-tune the various proposed details and processes.

10.6 Finalize and Begin Use of Classification System

As explained in this report, the Access Management Implementation Task Force accomplished a significant amount of work toward the completion of an access management classification system. Preliminary classifications were assigned and these were reviewed and refined by District Office review teams. This review process was completed in all districts except one (District 11) prior to the suspension of work. The manual review needs to be completed by District 11, and the implementation team should undertake a statewide overview of the results of this process to ensure an adequate level of consistency from District to District. It will also be necessary to update classifications on roads that have changed route numbers since the original work was completed (utilizing 2004 data).

At this point, even before a formal change to the KAR is made, the State Highway Engineer could send a policy memo to staff involved in project development and permitting activities stating that the classification of the roads within the access management classification database is adopted and that the draft access management standards are to be used as guidance in making decisions.

Additional details associated with the classification system would be development, by the implementation team, of a formal process for considering and making classification changes on specific routes and decisions related to responsibility for system maintenance (Recommended: Division of Planning) and mechanisms for the distribution of this information.

10.7 Encourage use of Corridor-Level MOUs

As discussed in Chapter 9, the Access Management Implementation Task Force initiated the concept of an Access Management Partnership Memorandum of Understanding, between the Cabinet and local governments, in conjunction with major corridor studies that involved access management recommendations. This practice should be strongly encouraged in the absence of a formal access management program, and it should be continued with the adoption of a program. In cases where detailed studies are conducted and/or cooperative agreements are negotiated, the resulting recommendations and these MOUs should take precedence over statewide standards.

10.8 Conduct Training

A critical part of making a statewide access management program succeed would be to train KYTC staff on the classification system, the standards, the various processes, and best practices involving access design. This is critical so that optimal and consistent decisions can be made

when designing highways or reviewing access permit applications. It will also be important to train local government staff (planning, engineering, planning/zoning commissioners) on access management and the workings of the statewide program so that future subdivisions of land and related access will be designed with knowledge of the benefits of access management and made in a manner that is consistent with the statewide requirements. A one-day training course should be developed and taught around the state on a regular basis. The Kentucky Transportation Center can assist with this training.

Another recommendation is that Kentucky regularly host the National Highway Institute Access Management Course. This intensive training deals with all aspects of access management and access design and allows for hands on exercises to gain understanding.

10.9 Prepare and Execute a Public Outreach Plan

Getting the word out about access management will be crucial to its success. First, educating the legislative committees that will be reviewing and considering an amendment to the KARs will help garner understanding and support of the purpose and benefits of access management. Second, after the KAR is modified, it is critical to get the word out to local planning and engineering staff, private consulting firms, developers and the general public about the new requirements to gain access to a state-maintained highway. Outreach may be done in many different forms including brochures, speaking engagements at conferences and local organizational meetings, media advertisements and development of a website. This should be done in conjunction with the Office of Public Affairs.

10.10 Long Term Tasks

1. Eliminate KRS 177.315 and 177.317. Although not detrimental to making an access management program succeed, it is recommended that these regulations be eliminated. KRS 177.315 outlines the spacing requirements for a partially controlled access facility. After KYTC has adopted an access management program, there will be no more need for this designation of access. KRS 177.317 specifically sets out spacing requirements for the Hal Rogers Parkway. Once again, after KYTC has adopted the program, this highway will have a designated classification and follow the same process as all other state highways.
2. Develop and refine the design guidelines that will be in the *Access Management Manual*. Also, the manual will need to be continually refined and updated as research and practices evolve. The access management Manager would be responsible for these activities.
3. Modify KRS 100.287 to require that any preliminary plat within a reasonable distance, for example one mile on both sides of a state highway, be reviewed and approved by the Transportation Cabinet. This is an important consumer protection measure. It would prevent subdivision configurations that do not meet access management standards and therefore remove the potential of denying access to an unsuspecting purchaser. This

change would also allow KYTC to play a more proactive, less resource intensive role rather than a policing role.

4. Continue encouragement of local planning and zoning units to implement access management standards and provide coordination. In addition to the KYTC access management model ordinance that was developed in 2004, KYTC should develop a set of model ordinances for roadway connectivity.

11. References

1. Committee on Access Management, "Access Management Manual", Transportation Research Board, Washington, DC, 2003
2. S&K Transportation Consultants, Inc., "Access Management, Location and Design", Participant Notebook for NHI Course 133078. National Highway Institute, Federal Highway Administration, April 2000.
3. Stamatiadis, N. et al., "Research Report KTC-04-05/SPR 251-01-1F: Access Management for Kentucky", Kentucky Transportation Center, University of Kentucky, Lexington, KY, February, 2004.
4. Kirk, A., Pigman, J., and House, B., "Research Report KTC-06-16/SPR 290-05-1F: Quantification of the Benefits of Access Management for Kentucky", Kentucky Transportation Center, University of Kentucky, Lexington, KY, July, 2006.
5. Gluck, J., Levinson, H.S., & Stover, V., "National Cooperative Highway Research Program Report 420: Impacts of Access Management Techniques", Transportation Research Board, National Research Council, Washington, D.C., 1999.

12. Appendix A

Access Management Implementation Task Force Meetings

Detailed summaries of each of the 15 task force meeting were prepared by the Transportation Center and distributed to task force members. The meeting summaries are presented in the following sections, A.1 – A.15. These summaries provide the primary means of documenting task force deliberations and decisions.

A.1 Access Management Implementation Task Force Meeting No. 1

The 1st meeting of the Access Management Implementation Task Force was held on May 11, 2004. Brent Sweger opened the meeting and asked those in attendance to introduce themselves. Attendance was as follows:

Task Force Members Present

David Beattie, District 8 (Design)
Annette Coffey, Planning
Scott Coppage, District 4 (Permits)
Steve Farmer, District 7 (Traffic)
Danny Jewel, Design
Linda Justice, State Highway Engineers Office
Tom Kerns, Right-of-Way
Chuck Knowles, Operations
Chad Larue, Permits
Gary Sharpe, Design
Ken Sperry, Preconstruction
Brent Sweger, Multimodal Programs (Vice-Chairman)

Task Force Members Absent

Dana Fugazzi, General Counsel

Others Present

Lynn Soporowski, Multimodal Programs
Phillip Mann, Permits
Ed Cummins, Permits

1. Brent explained why the task force was created and its mission. It was explained that Secretary Bailey had asked Ken Sperry to serve as the chairman and to assign members. It was noted that a decision had been made to limit task force membership to functions within the Transportation Cabinet and that the Kentucky Transportation Center at the University of Kentucky would be providing technical support. The Kentucky FHWA Division Office would also be invited to participate.
2. Barry House from the Transportation Center presented an overview of the Access Management for Kentucky research project. He explained the history of the access

management project; the concept, principles, and benefits of access management; and the differences between access management and access permitting. He described the practices of the states that surround Kentucky and identified other states that have implemented access management programs. Barry then explained the recommendations from the research study pertaining to a classification system, spacing standards, non-conforming access, and variance and appeals processes. The presentation concluded with a discussion of the recommended implementation steps and the role of the task force in each step. An outline of the presentation follows.

Brief History

- KYTC sponsored access management research study by University of Kentucky Transportation Center
 - Review current access management procedures
 - Develop an access management plan for Kentucky
- Study completed February 2004
- Implementation efforts initiated May 2004

What is Access Management

- The process of balancing the competing needs of traffic movement and land access by:
 - Providing land access without degrading safety or traffic flow
 - Utilizing the fundamentals of traffic engineering to determine the appropriate location and design of access
 - Evaluating the consequences of new access points
 - Outlining the appropriate guidelines or standards, in addition to administrative issues

Why Access Management?

- Improves safety
 - Reduces crashes by as much as 50%
- Reduces delay
 - Increase capacity by as much as 45%
 - Reduce travel time by as much as 60%
- Economic benefits
 - Improved access = Increased property value
 - Enlarges market and delivery area
 - Monetary savings from reduced crashes/delays
- Environmental impacts
 - Lower fuel consumption & pollutant emissions
 - Preserves neighborhood character
 - More attractive corridors

Principles of Access Management

- Provide a hierarchical roadway system based on function
 - Stress mobility for higher class roads
 - Stress safety for lower class roads
- Limit number of conflict points

- Separate conflict areas
- Remove turning vehicles from through-traffic lanes
- Preserve functional area of intersections and interchanges
- Locate signals to favor through movements
- Manage left-turn movements

Access Management vs. Access Permitting

- Philosophy
 - Access Management – Allowed access function of highway purpose
 - Permitting – Allows access for convenience subject to safety considerations only
- Practice
 - Access Management – Comprehensive statewide approach based on classification system and associated standards
 - Permitting – Case-by-case consideration subject to general guidelines

Benefits of Access Management to KYTC

- Eliminates weaknesses in current access permitting procedures
 - Access by Permit negates functional hierarchy of highway system - treats all roads as access roads
 - Permitting decisions based on general guidance
 - Urban/rural definition for Partial Control of Access leads to undesirable reductions in access spacing
 - Inconsistent/inadequate coordination with local planning units
- Provides framework for improved access permitting practice
 - Provides mechanism for basing allowable access on highway function
 - Provides a uniform set of standards and procedures for all state routes
 - Results in a fair and consistent decision making
 - Provides a structured defense for decisions
- Saves highway improvement dollars
 - Preserves function and capacity of highways
 - Extends useful life of highways
- Provides benefits to customers
 - Motorist
 - Improved safety
 - Reduced congestion
 - Property owner
 - Improved access to property
 - Enhanced property values
 - Increases market area for business
 - Communities
 - Preserves neighborhood character
 - Facilitates smart growth/community enhancement
 - Taxpayer
 - Good business practice by government

Neighboring States

- States with access management programs
 - Missouri (2003)
 - Ohio (2001)
- States with driveway guidelines or access permitting procedures
 - Illinois
 - Indiana (*Supplemental Note: Access Management Program under development 2005*)
 - Tennessee
 - Virginia (*Supplemental Note: Virginia implemented program in 2007*)
 - West Virginia

Other States with Access Management Programs

<ul style="list-style-type: none">• Colorado (1981)• Florida (1988)• Iowa (1995)• Kansas (1997)• Maine (2002)• Minnesota (2002)• Montana (in process)	<ul style="list-style-type: none">• New Jersey (1992)• Oregon (1995)• South Dakota (2000)• Utah (2001)• Texas (2003)• Washington (1989)• Wisconsin (1999)
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Supplemental Note: Since the time of this presentation Nevada, New Mexico, and Vermont have implemented programs. Arizona, Idaho, Louisiana, Mississippi, and North Carolina have programs under development.

Research Study Approach

- Develop a roadway classification system
- Recommend spacing requirements
- Propose variance/waiver procedures
- Develop implementation plan

Access Classification System

- Produce a new access management classification system for all state routes
- Functional classification a good starting point
- Adjust based on ADT and posted speed
- Refine further based on manual review
- Create a stable system that is not easily changed

Initial Classification Process

- 5 classes for urban and rural
- Initial match with functional class
 - F - Freeways/Parkways
 - I - Principal Arterial
 - II - Minor Arterial
 - III - Collector
 - IV - Local
- Adjust for traffic volume
 - Urban: 10,000 and 5,000
 - Rural: 5,000 and 2,500
- Adjust for posted speed limit
 - ≥ 45 mph
 - < 45 mph

Classification Algorithm

UK

Roadway Classification

	Rural			Urban				
	Speed	Volume		Speed	Volume			
Principal Arterial	≥ 45	$< 5,000$	$\geq 5,000$	≥ 45	$< 10,000$	$\geq 10,000$		
	< 45	II	I	< 45	II	I		
Minor Arterial	≥ 45	$< 2,500$	$\geq 2,500$	$\geq 5,000$	≥ 45	$< 5,000$	$\geq 5,000$	$\geq 10,000$
	< 45	III	II	I	III	II	I	II
Collector	≥ 45	$< 2,500$	$\geq 2,500$	≥ 45	$< 5,000$	$\geq 5,000$		
	< 45	III	II	III	II	I		
Local	All speeds & volumes			All speeds & volumes			IV	

Access Spacing Standards

- Standards recommended for
 - Interchange spacing
 - Signalized intersection spacing
 - Non-signalized intersection spacing (including driveways)
 - Median openings
 - Corner clearance
- Must consider spacing standard and sight distance

Proposed Spacing Standards

Spacing Standards													
Access Class	Typical Functional Class	Interchange Spacing (ft)				Signalized Intersection (ft)	Unsignalized Intersection (ft)	Median Type		Median Opening (ft)		Corner Clearance (ft) ¹	
		To Interc	A ¹	B ²	C ³			D ⁴	Traversable	Non-traversable	Full		Directional
Urban I	Principal Arterial	1 mile	900	900	2400	900	2400	1200/600 ⁵		X	2400	1200	1200/600 ⁶
Urban II	Minor Arterial	NA	600	900	2400	900	2400	450	X	X	2400	1200	450
Urban III	Collector	NA	600	600	1200	600	1800	300	NA	X ⁷	1800	600	300
Urban IV	Local	NA	NA	NA	NA	NA	NA ⁸	150	NA	NA	NA	NA	150
Rural I	Principal Arterial	3 miles	1200	1200	2400	1200	4800	1200		X	2400	2400	1200
Rural II	Minor Arterial	NA	1200	1200	2400	1200	2400	600	X	X	1200	1200	600
Rural III	Collector	NA	NA	NA	NA	NA	2400	450	NA	X ⁷	1200	600	450
Rural IV	Local	NA	NA	NA	NA	NA	NA	150	NA	NA	NA	NA	150

Non-Conforming Access

- Access management- standards not applied retroactively
 - Applied to requests for new access
 - Applied to changes in existing access
 - Applied to roadway upgrades
- Access that currently exists will frequently not comply with spacing standards
- Pre-existing access impacted only if usage changes

Variance/Waiver Process

- Some flexibility is required in access management regulations
 - Complexities may require alternative treatments
 - Impossible to anticipate and cover all situations to be encountered
- Unconditional application of minimum standards is not appropriate for all cases
 - Special or unique conditions
 - Negligible impact situations
 - Unjustified hardship on property owner

Variance – Basic Rules

- Process must be clearly understood and applied consistently to all applicants
- KYTC must follow same process as individual applicants when deviating from standards for highway projects
- Documentation is essential

Variance Process

- Level 1
 - Requests with no impact on highway operations (<75 trips/day & minor deviation from standard suggested in study)
 - Basic information and documentation of decision
 - Decision at District Office level

- Level 2
 - All other access requests or modifications
 - Requires more extensive review and justification
 - Traffic impact study for large developments (100 trips/hour)
 - Decision at Central Office level

Appeals Process

- Denial of permit, variance, or unacceptable permit condition
 - Hardship or economic loss justification
 - Weighed against impact on roadway operations
- Administrative process that must occur before applicant can resort to legal action
- Appeals committee, board, or hearing officer
 - Lessen undue influence

Implementation Plan Steps

- Form Access Management Implementation Task Force
- Develop plan and conduct public involvement and marketing
- Finalize access spacing standards
- Initiate roadway classification process
- Develop procedure for classification revisions
- Develop and process Administrative Regulation
- Develop procedures for non-conforming access
- Develop variance process
- Develop appeals process
- Define permitting process
- Define organizational structure and roles
- Develop Access Management Manual
- Conduct training

What Next ?

- SPR-funded access management implementation project for KTC assistance
- 2nd AM Implementation Task Force Meeting - June 9 (Successful Communities Conference)
- First steps
 - Develop public outreach plan
 - Finalize access management standards
 - Initiate classification system assignments

3. Ken Sperry suggested that access management might be more readily accepted if it were applied to arterial highways only. Barry House responded that it was the Transportation Center's recommendation that access management not be pursued on a piecemeal basis since the advantages of the proposed access management system lie largely in the comprehensive nature of the approach. It was noted that this idea had been raised previously during the March executive briefing session and that the Center had given considerable thought to the issue. The following conclusions were presented to the task force.

- Access Management should be thought of a clearly defined and consistently executed highway engineering and safety program, rather than as a general planning or policy issue. As such, it should be applied to all roadways under the Cabinet’s jurisdiction. Safety is of paramount importance on all roads, and the safety justification for access management applies to all roads.
- The means by which an access management program would serve to achieve the desired structure and order to the highway system is the access classification system upon which the program spacing and design standards are built. Piecemeal implementation on arterial routes only would not achieve the intended results.
- The difference between arterial routes and roadways on the lower functional systems lies primarily in the relative importance of the mobility function of the highway versus the property access function of the highway. Achieving the proper balance between these conflicting functions for different types of roadways is fundamental to access management principles. These differences will be built into the access management standards and procedures in the form of less restrictive spacing and design standards and more liberal waiver procedures on the lower systems, but it should still be an aim to achieve some level of improvement in access location and design on the lower system routes.
- As a new program, access management efforts are likely to be met with some level of opposition. It would be difficult to explain how access management should be a unique burden to property owners along arterial routes. Also, since this program would amount to a higher level of regulation of property rights to access, the Cabinet could have a difficult time justifying why property owners along arterial highways have less property rights than property owners along non-arterial highways.
- Limiting access management efforts to the arterial system only would not address the weaknesses that exist in the Cabinet’s current access permitting practices on the vast majority of the state-maintained system.
- None of the approximately 16 states that have implemented access management programs have done so on the arterial system only.

After a brief discussion the task force reached a consensus that Kentucky’s program should be developed to apply to the entire state-maintained system.

4. During the course of the meeting certain points/questions were raised, which have been recorded below for future consideration.
 - Should different standards be developed for different terrain types, such as the mountainous areas in eastern Kentucky?
 - Will access management be applied differently in project development versus permitting? Would it be advisable to start with project development and evolve to permitting?
 - The manner in which land is subdivided will create constraints that will have to be dealt with. How will this program interact with local planning and zoning?
 - The variance process should discourage “political” variances, but the program must be flexible enough to deal with this inevitable situation.

A.2 Access Management Implementation Task Force Meeting No. 2

The 2nd meeting of the Access Management Implementation Task Force was held on June 9, 2004. Attendance was as follows:

KYTC Members

David Beattie, District 8 (Design)
Annette Coffey, Planning
Scott Coppage, District 4 (Permits)
Steve Farmer, District 7 (Traffic)
Danny Jewel, Design
Linda Justice, State Highway Engineers Office
Chuck Knowles, Operations
Chad Larue, Permits
Gary Sharpe, Design
Brent Sweger, Multimodal Programs

Kentucky Transportation Center

Ted Grossardt
Barry House

Others

Mike Hancock, State Highway Engineers Office

This meeting was a question and answer session with Phil Demosthenes who previously managed Colorado's access management program and is currently a member of the Transportation Research Board's Access Management Committee. Phil prefaced his answers by saying he would give his opinions based on 27 years of experience with the Colorado DOT, but that there are many different valid opinions with respect to access management issues. The questions/answers follow below.

1. Should standards be based on topography (mountains vs. flatlands)?

No different standards except for engineering, such as grade adjustments; longer or shorter sight distances based on stopping uphill or downhill, for example. There is no published 'basis' for different standards, only for the physics of the situation. The issue is more how the agency will process and arrive at a decision where topographical situations make meeting standards very difficult or not feasible. I would recommend a documented process with descriptions, topography conditions, economic and design issues, analysis and final decision in the permit file (more on this under variance/waiver). Have the applicant's engineer provide the initial documentation and analysis. If you don't, 50% of applications will have undocumented subjective opinions as basis for the alleged physical problem. If the agency elects to allow the permit, you will need the justification in the file.

2. Are five rural and five urban classifications too complex for users/administrators to understand and use?

I believe ten classes are too complex. There are too few design considerations to split the choices into five different classes. You are splitting hairs that could more easily be described within the variations (text) of one specific category. From 1981 to 1998, Colorado had only five total categories: freeway, parkway, regional, secondary or dense urban, and frontage road. This worked reasonably well. In 1998 we went to eight. We expanded regional/urban to A-B-C, and rural to A-B. While this works a bit better, it has also added a little confusion. I would not recommend more than eight. We had thought about dividing frontage roads into high/low speed. But it wasn't that difficult to simply address higher and lower speeds within one classification.

3. How do you deal with stakeholders that have bought property without knowledge of standards? They will feel as if they deserve access. This could lead to very negative reactions from public.

Foremost, after adoption, try to reach the realtors, consultants (architects, planners, civil engineers, traffic engineers), and cities and counties. This will allow another opportunity to explain the benefits of access management and get the word out on new standards. (Be sure to collect names so you can say, "Mr. Smith, you were at the workshop six months ago, why are you now saying you were unaware of our new standards?")

Have a web page that is easy to find. Once this is adopted, you (the agency) do not have the option of letting someone off the hook simply because they didn't know. But you are not denying reasonable access anyway – you are just refusing to meet their expectations. And, their frustrated expectations are not sufficient justification to ignore engineering and public safety standards. When this happens it is not easy. But it is necessary. People at the front door, at the permit desk, need to have good people skills, and be able to help the applicant to the best of their ability within the new standards.

4. Are there ways in which to prevent the subdivision of land into parcels that will require direct access onto state highway? Many counties do not have planning and zoning or subdivision regulations.

We also have counties and municipalities without subdivision regulations, even a few without building and other permitting processes. Education is important. Appear at county and municipal conferences. District permitting people should have good relations with all local governments within their area. When the above happens here, we cannot stop the poor decision process that later requires more access permits than we had hoped. One of the keys, here, is the clearly defined basis for the local government providing any kind of approval. When the access management standards become adopted by the state they should clearly have a basis and clearly be engineering and safety standards. The public risks of ignoring these standards must also be included. Elected officials and local government staff, especially if they are a Professional Engineer, have a duty to use established standards that are published. Creating significant public safety problems on a roadway when they make a decision is a failure to do their duty – public health, safety and welfare (their statutory reason for being).

For land subdivided simply by ownership deeds, you can be stuck with the results. However, we have denied a few permits where the poor subdivision created lots whose only highway access was below any acceptable sight distance standard. We were threatened with ‘takings’, denial of property rights, and more. But we simply told them the truth – that the first people involved in a crash at their access would be them. The access would constitute a clear and present danger. It was their safety (and motorists) that we were protecting. They all backed down, and proceeded to get their money back from the seller. The seller, even if they were not aware of the situation, created the problem. Basically, the right of access does not trump the right of public safety – when the safety aspect is very compelling.

Another technique is to require that adjacent parcels share access. This way you are not denying direct access, you are only managing the location.

5. What ideas do you have to get the political will to accept our proposed access management implementation strategies?

First of all, I suggest education. Place an emphasis on public safety, saving taxes (less congestion) and improved economy (mobility = market area). Speak to topics important to elected officials, but also help them and upper management by making the standards clearly address engineering and public safety criteria. Politicians do not ignore building, electrical and fire codes for public buildings, why should they choose to ignore, or order staff to ignore, roadway safety standards? They need to understand that these really are standards, not just ‘planning’ recommendations. More people die or are injured in access related accidents in one week than in buildings in one year.

6. How can coordination between locals and state be better handled in order to get the result that we want and to eliminate the problem of the state being pitted against local planning and zoning as developers seek an access permit.

Education, good local government relations, and good people skills are needed. State adopted standards put everyone on the same page. There will certainly be times when a developer walks in for 4 access permits with a copy of his/her site plan already approved by the locals and already designed by a local consultant for \$20,000. The state permit officer realizes that the developer only qualifies for one access. This kind of situation shows why the front person is very important to the department and management. The ability of the permit officer to handle this difficult situation without it blowing up into a major political and legal battle is paramount.

If the KYTC has done a good job reaching out to consultants and engineers and has been able to publish articles in local trade journals, if I was the developer with the problem plans, I would sue my consulting engineer (he has a duty to know) and at least get a redesign free of charge. This issue did arise in the early 1980s in Colorado. But we survived. Any larger development will use professional services – who you have already worked to educate.

7. How do we follow through with the enforcement of standards? E.g. illegal driveways. KRS 177.106 seems to empower the agency for illegal access, which should also include violations of permit terms and conditions. What happens if a residential driveway is

converted into a 1,000 VPH driveway when the house is torn down and replaced with a store?

The state administrative procedures act should provide the process. Ask your attorney. Exercise agency police powers, use administrative licensing law, go to court if necessary. Agencies do not like to go to court and neither do developers. You can be strong enough in your pressure for compliance that the developer is willing to seriously consider a state determined compromise. One of the key legal areas not addressed in the Access Management of Kentucky research report is current case law for access related issues, i.e. denial of some access, restricted turns, required locations, and fewer access points. It is not sufficient to simply look at statute. You need to see how the courts have interpreted them.

8. How do we remove the “P” (political) factor from variances and appeals?

You can minimize it. Not only have a section that allows variances, but require clear criteria for the variance decision. Require documentation (in the file) of all issues that require the variance. Keep the lights bright. Have their consultant and a Professional Engineer provide a brief sealed engineering report describing the situation and recommending the solution. In other words, don't design the process to allow a political decision where an engineering decision is necessary. There can certainly be political pressure. Have a defined engineering process on the issuance of a document entitled 'waiver'. You will also be doing a favor for upper management and elected officials. While a few may be frustrated that they cannot get the answer they demand, most will appreciate that it is an engineering and safety decision, and they can use that as a strong reason responding back to whomever is applying pressure on them.

9. What are the best ways to approach public involvement – in the beginning stages of implementation and after a program is established? What level of input do we seek versus level of education about the proposal?

Education is very important. Focus on the decision makers and applicants. The majority of people, once they understand the public safety aspects and basis of the program, will not object to the program – but may argue the specifics of certain decisions. In the 23 year Colorado program, no one has tried to throw out the program. However, a few thought about it and only a few attempts have been made to water it down. Attend county and municipal conferences. Hold open all day workshops on access management for professionals – private and public sector engineers and architects. Publish articles. Have an easy way to find web page with good resources. Develop examples of everything that is standard. AutoCAD drawings, sample property plans, driveway layouts, and roundabout solutions. Make knowledgeable staff people available on-line (phone) to answer questions and for meetings and presentations.

10. How do we instill the concept to the public (political decision makers, citizens, developers) that this in being done for the common good (versus property rights)?

The data is clear. The lack of good access decisions is injuring and killing the citizens of Kentucky. So educate. Your adopted access program must be within the constitutional and statutory limitations of property rights. Given this, you are off to a good start. Then you are

arguing the gray areas and differences of opinions – and perhaps going to court to find out their opinion – and be willing to appeal. Getting some good court opinions really helps. Put a lot of energy into your first cases and get some wins – and only go forward with legal action on a case where the facts and issues are good for you. Know your case law. Educate your attorneys.

11. Give ideas on the development and selection of access management retrofit and median projects.

I have lots of ideas, but with retrofit, the factual situation is very important when determining a solution. So there are as wide a range of solutions as there are projects. We try to meet all the standards first. Then, as with any variance process, start working on the problem areas. But we don't have different or lower standards for existing roadways in retrofit projects. The issue is process and development of sound alternatives that improve the situation within a reasonable and budget possible level of feasibility. Consider a median opening policy that supplements spacing criteria.

12. Talk some on what it means to provide reasonable access.

The right of reasonable access is paramount to a given spacing standard, but I have always approached 'reasonable' as functional in terms of traffic operations, safety, capacity and design. Not as a matter of convenience for the owner or the standard marketing site design concepts for the various business types. Corporate standard layouts and convenience to the developer, either residential or commercial, cannot balance with the public safety aspects of allowing substandard access points. The agency decision to permit an access will decrease public safety and will increase the potential for crashes. An engineering decision should not place convenience and expectations above public safety. "Proof on Necessity" should be required even if spacing standards are met. So you aim for reasonable options, that to the best of the standards, achieve access the developer can live with – that will also be operationally sufficient for the activity on the land. There are two rights here – property rights and the right of the public to expect a reasonable level of safety in their travels. With what we now know of the impacts of no access management, modern access management is trying to find a better, safer, balance between these two competing rights.

In Colorado, the right to access is to the general (public) roadway system. If a property has reasonable access to a local road, it is not allowed access to the state highway system.

13. Requests for traffic signals are a problem. Are there better/more strict warrants than those commonly used?

Strict warrants? Not that I am aware of. But the MUTCD clearly allows the decision maker to consider many other aspects besides the warrant. Signals are not safety devices. They are operational controls. 99% of traffic signals generate more crashes than they prevent. Several unpublished studies are even reporting increases in both PDO and injury crashes. It is likely they increase fatalities due to the increase in red light running incidents and other behavioral issues. Signals are also anti-business. While one business may enjoy the immediate convenience of a signal in front of their property, signals decrease market area overall, hurting all local retailers and increasing the likelihood of crashes. The corridor travel time

increases, delay increases, speeds decrease. People divert to other businesses as the market area shrinks. This is one of the reasons large malls have focused on interchanges in the last ten years. They know signals will not proliferate on the freeway.

Another solution is traffic signal planning. Establish a plan that specifically identifies future allowable signal locations. This works better within a municipality as part of the their adopted official plans. Use a simulation model to achieve the best system efficiency. Be able to show how new requests diminish the planned system. Ask how they plan to mitigate their negative system impacts.

Don't let retail business signal and access demands dominate or overwhelm the thinking process. The real economic engine of a community is non-retail jobs (imported money – external selling – by the manufacture of goods and services external to the community). Also farm-to-market, rural to urban movement of goods and services is important. These non-retail businesses need quality transportation services. The long-term functional integrity of the system is very important. Retail will often be very influential since retail taxes are important to local government budgets, but again – this is not the real economic generator for a community. Other than owners and upper management, can you think of any retail employees that are well paid? Although they don't often see the relationships, retail business owners should be the strongest supporters of access management. Access management helps maintain their market area. Signals and congestion reduces market area. So unless there is new growth close to the retailer, market area maintenance is critical for long term business success. Downtown retail areas (large or small cities), which are often competing with suburban shopping centers, also need uncongested corridors linking them with their market.

14. How should we structure ourselves internally (KYTC) so that there is consistency between all activities (planning, traffic operations, design, permitting, etc.)? Many divisions have their own operating manual.

Are you one agency or a collection of agencies with authority to establish engineering and public safety decisions at the regional level? Colorado is decentralized for many project operations and decisions, but when an agency regulates property rights, regulates citizen rights, regulates engineering standards, these, as a matter of law, must be consistent throughout the agency. Colorado only has one operating manual. All citizens have the right to be treated equally. When I see a regional office create their own manual, worksheets and guidance, I know that I am not providing them with the materials they need. So I act to improve the program and help them. If region staff is not following the regulations, the law of the land, they are violating the law and the terms of their employment. (We have not fired anyone, but we have found a 'better' location for them within the agency.) They are putting the agency at risk for tort and violation of rights. The public must trust agency staff to do their job as defined by laws and standards. If it is an internal disagreement of application and design, then work on training and understanding the problems faced at the local level. It takes a brave and strong person to be a good permit officer. It's one of the most stressful jobs within the agency if they are doing their job well.

15. Do you have any recommendations on the Implementation Plan recommended in the *Access Management for Kentucky* report and the order that strategies should be completed?

I would recommend having a complete package so they can all see how the total program works. This would include procedures, policies, standards, access classifications and their specific assignments. It's like crossing a busy road. Small slow steps simply increase your exposure to more traffic that can hit you. You need a public process, but nothing is more descriptive than simply commencing with the program quickly. Go on the road with a complete package and a good presentation.

16. During the course of the session certain miscellaneous points were raised, which have been recorded below for future consideration.

- Access spacing standards are more like a “should” condition than a “shall” condition.
- Colorado has a “field” entrance access type (usage less than once per day) that is not subject to spacing standards.
- With respect to the number of access classifications, it was noted that although five access classes (for both urban and rural) were recommended by the Access Management for Kentucky research study, one class is for fully controlled facilities, which leaves only four classes for which standards will be developed and applied. It was also noted that Kentucky has approximately three times the state-maintained mileage as does Colorado.

A.3 Access Management Implementation Task Force Meeting No. 3

The 3rd meeting of the Access Management Implementation Task Force was held on July 1, 2004. Attendance was as follows:

KYTC Members

Annette Coffey, Planning
Scott Coppage, District 4 (Permits)
Steve Farmer, District 7 (Traffic)
Dana Fugazzi, General Counsel
Danny Jewel, Design
Linda Justice, State Highway Engineers Office
Chuck Knowles, Operations
Chad Larue, Permits
Ken Sperry, Preconstruction
Brent Sweger, Multimodal Programs

Kentucky Transportation Center

Barry House

Others

Greg Rawlings, FHWA
Lindsey Mefford, Multimodal Programs

1. Brent Sweger provided an overview of the decisions that would need to be made by the task force over the next several months and initiated a discussion of committee ground rules and strategies that the group might use for consensus building. Ken Sperry cautioned that all decisions made by the group would amount to recommendations only, until accepted by the Secretary of Transportation and put into effect by Administrative Regulation. This led to a lengthy discussion of the feasibility of implementing an access management program and the level of support for the task force's work from top management. A wide range of opinions on this issue were expressed by task force members, and it was suggested that a formal indication of support was needed.

During the above mentioned discussion an observation was made that there is a strong tie-in between access management and the official Vision Statement and Goals and Objectives of the Cabinet. In particular, the vision component, "provide a safe and reliable transportation system"; the goal, "ensure mobility and access"; and the objectives, "preserve the transportation system infrastructure" and "improve transportation safety" were noted to be fundamental to access management.

2. A discussion of the Implementation Plan recommended by the Access Management for Kentucky study ensued. It was explained that the first step recommended for the task force was to develop and execute a public involvement plan. Barry House called attention to the following recommendation and explanation contained in the *Access Management for Kentucky* report.

"A public involvement plan should be developed to ensure adequate involvement of stakeholders throughout the implementation process. States that have implemented access management programs generally feel that public involvement is crucial to the success of the program and that these efforts should begin early in the process. Public involvement activities might include some or all of the following: regional public information meetings or workshops, presentations to interest groups, statewide conferences, and a web site. Marketing materials such as PowerPoint presentations, brochures, and videos should be developed or acquired to assist with public involvement efforts."

"It should be understood by KYTC decision makers and members of the task force that implementing an access management program could be a controversial undertaking. Marketing of the concept of access management will be an important component of public involvement activities. But, even with an effective marketing program, it is probably unrealistic to expect consensus from all stakeholders on all aspects of the program. Public involvement efforts should seek to fully inform and identify points of agreement as well as diverging opinions. The points of disagreement should be responded to in sufficient detail so that participants are made to feel that their opinions have been considered and dealt with fairly. An absence of active opposition rather than total acceptance is probably the most realistic goal of the public involvement process for implementing an access management program."

Based on concerns related to the lack of management support and potential public opposition, there was a general consensus among task force members that public involvement efforts should be deferred until the parameters of the program are better defined.

3. Questions were raised about the proposed access management classification system. Barry explained the classification strategy and its use of functional classification, traffic volume, and posted speed limit. Members of the task force asked to see some case study examples of how the classification strategy would be applied to actual roadways. These will be presented at the next task force meeting.

A.4 Access Management Implementation Task Force Meeting No. 4

The 4th meeting of the Access Management Implementation Task Force was held on August 12, 2004. Attendance was as follows:

KYTC Members

David Beattie, District 8 (Pre-Construction)
Annette Coffey, Planning
Scott Coppage, District 4 (Permits)
Linda Justice, State Highway Engineers Office
Tom Kerns, Right-of-Way
Chuck Knowles, Operations
Chad Larue, Permits
Gary Sharpe, Design
Brent Sweger, Multimodal Programs
Ray Polly, Representing Ken Sperry

Kentucky Transportation Center

Ted Grossardt
Barry House
Jerry Pigman
Nick Stamatiadis

1. Brent Sweger opened the meeting and passed out Colorado's Access Permit Decision Flow Chart as an example of how permitting decisions could be made under an access management program. Key decision points in this process were pointed out and discussed:
 - Does the requested access meet criteria for direct access?
 - Is reasonable access available on a lesser street?
 - Will a traffic signal be considered?
 - Does the location meet the appropriate spacing standard?
 - Would requested access meet waiver criteria?
 - Will denial of request result in denial of reasonable access?
 - Is there a solution that meets reasonable access and design/safety criteria?

It was stressed that access management is more than just the application of spacing and design standards; it should be approached as a process.

2. Barry House went through case study examples illustrating how two specific roadways would be classified for access management purposes, the spacing standards that would result from this classification, and what these standards would mean for the land use that currently exists along these roads and for changes in land use that are likely to occur in the future.

The classification strategy and its use of functional classification, traffic volume, and posted speed limit was explained. The individual sections created by changes in these data items were examined, and there was discussion of how route continuity and other considerations (such as adjoining land use) would necessitate some refinements in the initial data-determined classifications.

The access spacing standards that would be established by the classification of route segments were then compared to existing access spacing along these roads. The common case where existing access spacing would be substantially less than the standard was discussed. It was stressed that this reality does not mean that access management cannot be applied to these routes. The group was reminded that the access management program will apply to new development and existing access will not be impacted unless there is a change in use. Opportunities to apply access management along the case study routes were discussed.

The differences between what could result under current practice versus desired outcomes with an access management program were discussed for a large vacant parcel at the intersection of US 460 (an Urban Minor Arterial) and Steadmantown Lane (an Urban Collector) in Franklin County. It was explained that a worst-case - although certainly possible - scenario under current guidelines could produce a new signalized access on US 460, resulting in three traffic signals within a 1,200-foot distance, whereas the proposed access management program would likely result in access to the site from Steadmantown Lane only, with the additional possibility of a right-in/right-out on US 460.

3. After a round-table discussion involving all Task Force members in attendance, the group approved the access management classification system definitions and strategy recommended in the *Access Management for Kentucky* research report.
4. During the course of the meeting certain points/questions were raised, which have been recorded below for future consideration.
 - Speed limit changes over short distances should perhaps be ignored during the classification process.
 - Counties without Planning & Zoning will be problematic in that land could be subdivided in a manner that is not consistent with spacing standards.
 - Will spacing standards have an impact on property value (currently conversion of roadways from access by permit to partial control may have some impact)?

A.5 Access Management Implementation Task Force Meeting No. 5

The 5th meeting of the Access Management Implementation Task Force was held on October 7, 2004. Attendance was as follows:

KYTC Members

David Beattie, District 8 (Pre-Construction)

Annette Coffey, Planning

Dana Fugazzi, General Counsel

Tom Kerns, Right-of-Way

Chuck Knowles, Operations

Chad Larue, Permits

Gary Sharpe, Design

Ken Sperry, Preconstruction

Brent Sweger, Multimodal Programs

Kentucky Transportation Center

Barry House

Nick Stamatiadis

Others

Greg Rawlings, FHWA

Kong Ee, Multimodal Programs

1. Brent Sweger opened the meeting and passed out summary notes from the 2004 National Access Management Conference. The conference was attended by approximately 300 persons (including Sweger and House) from several states. Highlights that were pointed out during the discussion included:
 - Flexibility is very important with respect to access management regulations, but the standards should not be downgraded in order to achieve it. Instead, flexibility should be built into the process.
 - Recent research has shown that the placement of medians is the most effective way to reduce highway fatalities.
 - Median openings should not be thought of as simply a means of providing access. They should be considered as a traffic control device.
 - Several states, in various parts of the country, have implemented access management programs, and they have proven to be successful. A few states that have had AM programs for several years have enabling legislation, but others that have implemented programs recently have implemented internal policies, without specific legislation, based on the broad authority given to most state highway agencies (including Kentucky) to plan, design, construct, operate, and maintain highways as, necessary, for the efficient movement of traffic.

2. Brent Sweger advised the group of the recent publication of two research reports that should be useful resources for the implementation of an access management program in Kentucky:
 - NCHRP Synthesis 332, “Access Management on Crossroads in the Vicinity of Interchanges”
 - NCHRP Report 524, “Safety of U-Turns at Unsignalized Median Openings”
3. Brent Sweger summarized decisions made at the last task force meeting related to the access management classification system. At the August 12 meeting the task force approved the access management classification system definitions and strategy recommended in the *Access Management for Kentucky* research report. Barry House reported that a data set containing updated functional classification designations along with traffic count and posted speed limit data had been received from the Division of Planning (on 09/27) and that the Transportation Center would begin work on developing the computer programming necessary to assign a preliminary access management classification to all state-maintained highway segments.
4. Brent Sweger, Chuck Knowles, and Ken Sperry reported on recent indications of top management support for the work of the task force and changes in task force leadership. It was reported that Commissioner Marc Williams is very supportive of the concept of access management and the work of the task force. He may suggest deadlines for completion of the task force’s work. Also, in recognition of the belief that the main challenges associated with access management will be in the permitting area, as opposed to the preconstruction area, it has been decided that Chuck Knowles should assume the role of Chairman of the task force.
5. Nick Stamatiadis gave a presentation on the proposed access spacing standards that were developed as a part of the Access Management for Kentucky research project. Spacing principles and issues were discussed and proposed standards were presented for interchange spacing, interchange crossroad access spacing, signalized intersection spacing, non-signalized intersection spacing, median use and median opening spacing, and corner clearance. It was explained that the research recommendations were developed primarily from a review of the literature and an assimilation of the practices of other states with access management programs, with some modification for consistency with Kentucky’s current practices with respect to partial control of access facilities (use of 600 ft. intervals rather than the conventional 660 ft., or 1/8 mile, intervals). During the discussion it was stressed that it is the responsibility of the task force to give thorough consideration to each set of recommendations and either adopt as selected standards for Kentucky’s program or modify as deemed necessary for application in Kentucky.
6. The discussion was then focused specifically on the proposed standards for signalized intersection spacing. It was noted by the researchers that this was the access management technique where the greatest consistency was found among state practices. After considerable discussion the group approved the signalized intersection spacing recommendations contained in the *Access Management for Kentucky* research report (Section 9.3.2, pages 55 – 60, and Table 9-36, page 76).

7. Many comments were made by members of the group during the standards presentation and the discussion of the standards for signalized intersection spacing. These can be summarized generally by the points listed below:
 - In considering spacing standards we should try to balance mobility and safety benefits against the costs required to achieve the standards.
 - Standards should not be so “tough” that they are impossible to live by.
 - A well thought out variance or waiver process and rules will be critical to the success of the program and the viability of the standards.
 - Standards will be much easier to meet for new construction than for reconstruction projects.
 - We should not create a system that requires a variance for every case.
 - The researchers at KTC put a lot of effort into the study and did quality work. The recommendations from the study should be accepted unless we are sure that they will not work and we have specific ideas on how they should be changed.

A.6 Access Management Implementation Task Force Meeting No. 6

The 6th meeting of the Access Management Implementation Task Force was held on November 4, 2004. Attendance was as follows:

KYTC Members

Scott Coppage, District 4 (Permits)
Steve Farmer, District 7 (Operations)
Chuck Knowles, Operations
Chad Larue, Permits
Gary Sharpe, Design
Ken Sperry, Preconstruction
Brent Sweger, Multimodal Programs

Kentucky Transportation Center

Barry House
Jerry Pigman

Others

Greg Rawlings, FHWA

1. Brent Sweger opened the meeting with an overview of the Florida Access Management CD Library and passed out a copy of the TRB Access Management Manual to each member of the task force that had requested one.
2. Barry House reported that the computer programming necessary to make the initial access management classification assignments was nearly complete. He passed out a handout with several tables that summarized the preliminary results. He called attention to the fact that less than 10% of the rural mileage was assigned to the most restrictive Rural I class while

approximately 40% of the urban mileage was assigned to the most restrictive Urban I class (see table below). Barry explained the difficulties that have occurred because of the many short sections in the data set and the short-section thresholds (over which the classification should not be allowed to change), but added that most of this has been overcome by logic checks made by the program.

Access Management Classification (AMC) Breakdown

R1 - Rural I	2,210.180	9.25%
R2 - Rural II	3,056.255	12.79%
R3 - Rural III	13,200.507	55.24%
R4 - Rural IV	5,430.487	22.72%
Total	23,897.429	100.00%
U1 - Urban I	898.116	41.90%
U2 - Urban II	685.886	32.00%
U3 - Urban III	410.047	19.13%
U4 - Urban IV	149.579	6.98%
Total	2,143.628	100.00%

3. Brent Sweger advised the group that a special team would be established to assist the task force with defining processes for permitting, waivers, and appeals. This team will be made up primarily of Central Office and District permitting staff since most of the issues related to these processes involve the permitting function. He stated that the team would focus on defining the formal processes necessary for making permitting decisions under the emerging access management program and that the team would bring their proposals before the task force for approval. Chad Larue is working on identifying team members.
4. Brent Sweger reviewed the decisions that were made at the August meeting with respect to the spacing standards for signalized intersections. He then passed out a table of proposed median type standards (see below), which were adapted from those presented in the *Access Management for Kentucky* research report. After considerable discussion the group decided that a median type standard was needed, and the standards shown in the table below were approved. Decisions regarding median opening spacing were deferred to the December meeting.

Median Type Standards

Access Classification	Typical Functional Class	Median Type
Freeway – U	-	• Nontraversable
Freeway – R	-	• Nontraversable
Urban I	Principal Arterial	• Nontraversable
Urban II	Minor Arterial	• Nontraversable (multilane facility) • TWLTL (2-lane facility)
Urban III	Collector	• Nontraversable (multilane facility) • TWLTL (2-lane facility)
Urban IV	Local	• NA
Rural I	Principal Arterial	• Nontraversable • TWLTL* • Undivided w/Left Turn (2-lane facility)**
Rural II	Minor Arterial	• Nontraversable • TWLTL* • Undivided w/Left Turn (2-lane facility)**
Rural III	Collector	• NA
Rural IV	Local	• NA

* Two-Way Left Turn Lanes are recommended on two-lane roads containing preexisting high access density.

** Left Turn Lanes are recommended at newly permitted access points

Notes:

1. If a project team decides that a different median type is needed for a safety or traffic operational reason, they may request a variance to the standard.
 2. Additional guidance should be developed on the use of TWLTL. Guidance should include traffic volume and access density thresholds.
5. Several comments and questions were expressed by members of the task force during discussion of the median type standards. These can be summarized generally by the points listed below:
- Decisions regarding median use and type are currently made on a project-by-project basis by project design teams.
 - There has been considerable inconsistency in the decisions that have been made in the past with respect to median use and type. Project design teams would benefit from having a standard to refer to, and this should lead to greater consistency in practice,

although they should still have the flexibility to deviate from the standard when there is good reason.

- What minimum width should be considered as acceptable for a depressed median? The Green Book specifies 30 feet, but the Cabinet is using 18 feet on the Wendell Ford (WK) Parkway, and this appears to be an improvement over the raised median that previously existed.
- Without adequate corner clearance raised medians are needed at urban intersections to keep left turns out of the intersection influence area.
- There was some concern that the extensive use of nontraversable medians and the right-in/right-out only access that results forces drivers to make U-turns at points where it may not be safe to do so. This concern was countered with the observation that U-turns work well once drivers get accustomed to them, and they have been proven to be a safe movement when properly designed for.

A.7 Access Management Implementation Task Force Meeting No. 7

The 7th meeting of the Access Management Implementation Task Force was held on December 2, 2004. Attendance was as follows:

KYTC Members

Annette Coffey, Planning
Scott Coppage, District 4 (Permits)
Steve Farmer, District 7 (Operations)
Dana Fugazzi, General Counsel
Tom Kerns, Right-of-Way
Chuck Knowles, Operations
Chad Larue, Permits
Ken Sperry, Preconstruction
Brent Sweger, Multimodal Programs
Duane Thomas, Traffic

Kentucky Transportation Center

Barry House

Others

Scott Thomson, Multimodal Programs

1. Brent Sweger opened the meeting by announcing that two new members had been added to the task force – Duane Thomas from the Division of Traffic and Jim Brannon from District 6. It was also announced that Gary Sharpe was retiring and would no longer be involved with the task force.
2. Brent Sweger informed the group that Madison County had made an inquiry to the Cabinet about access management. They are interested in developing a local ordinance. They were referred to the model local ordinance on the Cabinet's access management web site.

3. Brent Sweger reported on the access management national teleconference that occurred on Dec. 1. Of particular interest was discussion related to the impacts of a new law in Oregon that requires the government to pay damages to property owners when government land use decisions or actions cause a devaluation of property. This is of interest in Kentucky because a similar law was proposed during the last legislative session. Advice offered by teleconference participants was that access management advocates should stress that access management is an engineering and safety program and that access management actions are the result of engineering decisions rather than land use decisions. Such decisions generally fall under the police powers afforded to government agencies, and as such, they are not compensable. Barry House added that the confusion arises because changes in access designation are often made in conjunction with a highway improvement project where there is physical taking of right-of-way (or an easement), for which there is compensation, and this obscures the fact that we are not compensating for the change in access.
4. Brent Sweger passed out a draft of the access management chapter that has been prepared for the revised Highway Design Guidance Manual. He asked the group to review the document and provide comments by Dec. 8.
5. Barry House reported on the progress that had been made in developing the access management classification system for state-maintained highways in Kentucky. He reported that the computer programming necessary to make the initial classification assignments had been completed and that the Division of Planning had used the resulting classification codes for each highway segment to produce classification system maps. Examples of county maps of Hardin and Franklin counties and city maps of Elizabethtown and Radcliff were shown to the group. Barry explained that the next step in the process would be to print similar maps for each county and city and send them to the District Offices for review and refinement of the initial classification assignments. Such refinement is needed to identify cases where the functional classification, traffic volume, and speed data did not produce the optimal classification or where changes may be needed for system continuity. Barry added that guidelines would be developed and training would be provided to each District so that consistent results could be achieved. The group was referred to page 41 of the *Access Management for Kentucky* research report for examples of potential revisions. Members of the group then exchanged ideas on who should lead this task and the personnel within the Districts that should be involved. It was suggested that the Division of Planning should lead this effort and that the planning staffs within the Districts should probably lead the local review, although others (operations, permits) should be involved.
6. Scott Coppage gave a presentation on access management principles that had been applied in a Wal-Mart and Lowes development on KY 245 in Nelson County. In this case the Cabinet was able to achieve a higher level of access management than our current regulations require because of a cooperative working relationship between the Cabinet, the developers (who understood the importance of good access management), and the local government.

7. Brent Sweger informed the group that a team had been established to review and enhance the access permitting process and to develop supporting variance and appeals processes. Team members include Chuck Knowles, Chad Larue, Brent Sweger, Philip Mann, Ed Cummins, Lloyd Seales, and Barry House. This group will bring their recommendations before the full task force when their work is completed.
8. Brent Sweger reviewed the progress that has been made to this point in the finalization of standards for Kentucky's access management program. In previous meetings standards have been approved for signal spacing and median type. Brent then led a discussion of the standards that have been proposed (in the *Access Management for Kentucky* research report) for interchange spacing. After a brief discussion it was decided to defer the final decision until the January meeting.
9. Several comments and questions were expressed by members of the task force during the course of the meeting. These can be summarized generally by the points listed below:
 - In some cities/counties there are planning and zoning regulations that require certain developments to have two access points. This can be contrary to the principles of access management, and it is an issue that will need to be dealt with – probably through education.
 - Is there a standard definition for “reasonable access”? It was discussed that reasonable access tends to be decided on a case-by-case basis, but that requirements for reasonable access do not necessitate direct access or multiple access points.
 - A concern was expressed that there may not be sufficient support for access management by top-level management within the Cabinet and that the products of the task force's work will not be accepted. These concerns led to an announcement by Ken Sperry that he was removing himself from the task force.

A.8 Access Management Implementation Task Force Meeting No. 8

The 8th meeting of the Access Management Implementation Task Force was held on February 3, 2005. Attendance was as follows:

KYTC Members

David Beattie, District 8 (Pre-Construction)

Annette Coffey, Planning

Ananias Calvin, Design

Scott Coppage, District 4 (Permits)

Steve Farmer, District 7 (Operations)

Chuck Knowles, Operations

Chad Larue, Permits

Brent Sweger, Multimodal Programs

Duane Thomas, Traffic

Kentucky Transportation Center

Barry House

Others

Greg Rawlings, FHWA

1. Brent Sweger opened the meeting by introducing Ananias Calvin as the new representative from the Division of Highway Design. Ananias replaces Gary Sharpe, who retired, and Ken Sperry who resigned from the task force.
2. Brent Sweger informed the group that he recently made a presentation on access management to District and ADD planning staffs. There was particularly strong interest expressed from several ADD representatives. Brent reported that he has received inquiries or expressions of interest from Henderson, Maysville, and Williamstown and that the Cabinet will provide assistance to these cities. He has also learned that Bracken County is developing access management regulations as a part of their updated subdivision regulations.
3. Chuck Knowles gave a report on an access management status briefing that was presented to Highway Commissioner Marc Williams and State Highway Engineer Sam Beverage in January. During that discussion Mr. Williams reiterated his support for the work that the task force is doing, and he directed that the task force should continue its efforts to develop an access management classification system, finalize access spacing and design standards, and to recommend modifications to the access permitting process, including the development of waiver and appeals procedures. Barry House added that KTC has prepared a proposal for next year's research program to address a concern that was expressed during that meeting. Commissioner Williams stated that when the Cabinet presents the proposed program to the Legislature and to the public he would like to have specific estimates of the benefits that would be produced by the program. Barry explained that the *Access Management for Kentucky* research report included considerable discussion of the types of benefits that would be produced by an access management program, but that no effort had been made to quantify

the value of these benefits to Kentucky. KTC will attempt to do this if the research proposal is approved.

4. Chad Larue reported on the efforts to date by the Permitting team. He explained that two meetings have been held and that the group is currently working on a flowchart for an enhanced process that will incorporate formal waiver and appeals procedures. Chad explained that greater consistency in procedures and decision-making is a primary objective of this task. It was also discussed that there is a desire to have waiver and appeals decisions made by a committee rather than a single individual (currently the State Highway Engineer). This issue generated considerable discussion about the potential make-up and function of such a committee.
5. Barry House reported on the progress that has been made in developing the access management classification system for state-maintained highways in Kentucky. He reported that the initial computer-generated classification assignments has been completed and that the Division of Planning has developed GIS routines to use the classification codes for each highway segment to produce classification system maps. He explained that the next step in the process would be to have the District Offices review and refine the initial classification assignments. Such refinement is needed to identify cases where the functional classification, traffic volume, and speed data did not produce the optimal classification or where changes may be needed for system continuity. Barry added that guidelines and training has been developed for the manual review and that District 4 would be the first District to undertake this process following a training session on February 11.
6. Barry House gave a presentation on median opening spacing, reporting on the findings and conclusions of the recently published NCHRP 524 “Safety of U-Turns at Unsignalized Median Openings” and on recommendations contained in the Florida Median Handbook and AASHTO Green Book. Highlights from this presentation are listed below.

NCHRP 524 Conclusions:

- AM strategies that increase U-turn volumes at unsignalized intersections can be used safely and effectively.
- Crashes related to U-turn & left-turn maneuvers at unsignalized median openings occur very infrequently.
 - Urban: 0.4 accidents per median opening per year
 - Rural: 0.2 accidents per median opening per year
- Median opening accident rates are much lower for midblock openings than at 3 and 4-legged intersections.
- Median opening accident rates are lower for directional median openings than for conventional median openings.

Other Research Findings:

- Eliminating direct left turns from driveways and replacing with indirect U-turn maneuvers results in a 20% reduction in accident rate. (NCHRP 420)

- Directional median openings have 1/3 the accident rate of TWLTLs and 2/3 the rate of conventional median openings. (MI study)
- Right turns followed by U-turns provide similar or shorter travel times compared to direct left turns from driveways under heavy volume conditions when diversion distances are less than ½ mile. (NCHRP 420)

NCHRP 524 Recommendations:

- Midblock median openings should be considered as a supplement or an alternative to median openings at 3 or 4-legged intersections.
- Directional median openings at 3 or 4-legged intersections, combined with directional midblock median opening(s), should be considered as an alternative to conventional median opening intersections.

AASHTO Green Book Recommendations:

- Median openings should only be provided for street intersections or for major development.
- Spacing between median openings should be adequate to allow for left-turn lanes.
- Full median openings should be consistent with traffic signal spacing criteria.
- Spacing of openings should be consistent with access classification of the roadway.

NCHRP 348 Recommendations:

- The spacing of median openings for signalized driveways should reflect traffic signal coordination requirements and the storage space needed for left turns.
- The spacing of median openings for unsignalized driveways should be based on a roadway's function and location (urban/ rural) and should be conducive to signalization.
- Median openings for left-turn entrances should be spaced to allow sufficient storage for left-turning vehicles.
- Median openings at driveways could be subject to closure where volumes warrant signals, but signal spacing would be inappropriate.
- Median openings should be set back far enough from nearby signalized intersections to avoid possible interference with intersection queues, and storage for left turns must be adequate.

Unfavorable Conditions:

- Median openings should not be allowed at locations with inadequate sight distance.
- Median openings should not be allowed where there is not adequate spacing for left-turn storage (including deceleration).
- Median openings should not encroach on the functional area of another median opening or intersection.
 - Within the limits of auxiliary lanes
 - Within the limits of regularly forming queues
- Median openings that allow traffic to cross exclusive turn lanes should not be allowed.

7. Based on the research and literature review, Barry recommended that certain changes be made to the median opening standards proposed originally in the *Access Management for Kentucky* research report (see table below). During the discussion of standards that followed it was pointed out that for the Rural I classification the 2,400-foot spacing for full median openings was not consistent with the 4,800-foot spacing that had previously been accepted for signalized intersections and the AASHTO and NCHRP recommendations that full median opening spacing should be consistent with traffic signal spacing criteria. This discrepancy was discussed, and it was decided that the 4,800-foot standard for signalized intersections was overly restrictive and should be reduced to 2,400 feet.

Proposed Median Opening Spacing Standards

Access Class	Typical FC	Original Recommendation		Revised Recommendation	
		Full Median	Directional Median	Full Median	Directional Median
Urban I	Principal Arterial	2,400	1,200	2,400	1,200
Urban II	Minor Arterial	2,400	1,200	2,400/1,200*	1,200/600*
Urban III	Collector	1,800	600	1,200	300
Urban IV	Local	NA	NA	NA	NA
Rural I	Principal Arterial	2,400	2,400	2,400	2,400
Rural II	Minor Arterial	1,200	1,200	2,400	1,200
Rural III	Collector	1,200	600	1,200	600
Rural IV	Local	NA	NA	NA	NA

* Larger spacing value applies to routes with posted speed >45 mph

Note: Mid-block median openings (used for U-turns only) may be located 300 feet from an intersection at which left-turns are restricted if the following conditions are met: (1) adequate sight distance; (2) adequate space for accommodating the U-turn design vehicle; (3) adequate space for incorporation of a “left-turn” auxiliary lane; and (4) there is no potential for use by drivers desiring to turn left from nearby driveways.

8. Brent Sweger discussed his desire to finalize standards at the next task force meeting. He requested that task force members review the standards that have been proposed in the *Access Management for Kentucky* research report and the revisions proposed at this meeting and be prepared to either accept them or suggest specific changes. The group was in agreement with this plan of action.

A.9 Access Management Implementation Task Force Meeting No. 9

The 9th meeting of the Access Management Implementation Task Force was held on March 3, 2005. Attendance was as follows:

KYTC Members

Jim Brannon, District 6 (Planning)
Ananias Calvin, Design
Scott Coppage, District 4 (Permits)
Chuck Knowles, Operations
Brent Sweger, Multimodal Programs

Kentucky Transportation Center

Barry House

1. Brent Sweger led a discussion of access management standards. Standards that were proposed initially in the *Access Management for Kentucky* research report and revisions that have been made to date were reported, and additional revisions that have been suggested were discussed. Highlights of this discussion are summarized in the sections that follow.
2. For signalized intersections, it was agreed that the spacing standard for the U3 classification could be reduced from 1,800 ft. to 1,200 ft. (the KY program equivalent of ¼-mile). It was felt that this would allow reasonable traffic flow on these routes that are intended to give equal priority to land access. Similarly, the spacing standard for the R3 class was reduced from 2,400 ft. to 1,800 ft. The desirability of maintaining the spacing standard at 2,400 ft. for Class 1 and 2 highways (urban and rural) for signal progression purposes was stressed.
3. For median opening spacing, the changes to the standards that had been proposed at the February task force meeting were reviewed, and additional changes were presented. It was discussed that for Access Classes R1, U1, R2, U2(>45 mph), and U3, the spacing for full median openings should be consistent with signal spacing standards. It was agreed that for Classes U2(<45mph) and R3 the spacing for full openings could be reduced to one-half the signal spacing standard under the assumption (and with the stipulation) that consecutive openings would not be signalized.

The 300-ft. spacing for directional openings on U3 facilities was noted to be very minimal, but it was felt that this spacing could be accepted given the safety characteristics of directional openings that have been demonstrated in recent research (as reported at the February meeting). A caution was added that such openings should only be allowed where there is adequate room for left-turn/U-turn auxiliary lanes (deceleration and storage).

Additional changes to the standards were discussed and accepted for Classes R2 and R3. It was felt that the spacing for directional median openings on these facilities could be reduced to 800 ft. for R2 (one-third the full opening spacing) and 450 ft. for R3 (one-half the full opening spacing). These changes were deemed to be appropriate due to the operational and safety characteristics of directional openings. It was pointed out that directional median

openings have not been utilized much previously in Kentucky, but that the use of this design technique should increase in the future.

4. Discussion of spacing standards for unsignalized intersections centered around a new proposal that would allow significantly reduced spacing for certain land uses that would have negligible impacts on highway safety and traffic flow. It was proposed that two “Access Type” categories (at this point called Type A and Type B) be incorporated within the standards. The spacing standards that were proposed previously in the *Access Management for Kentucky* research report would be applied to Type A access requests, while Type B access requests could qualify for reduced spacing. Type B land uses would include single-family dwellings, multiple-family dwellings of three (or four) units or less, and farm/field access. Access Type A would include all commercial access, residential subdivision access, and any land use not included in Type B. Barry House explained that this approach was developed in response to concerns that the previously proposed standards did not distinguish between types of land use or level of impact and essentially treated all applicants the same (“We’re treating Grandma’s driveway the same as Wal-Mart”). And, there were major concerns by several persons on the task force (and others within the Cabinet) that the initially proposed standards were too restrictive for negligible impact land uses. He stated that presentation of standards to the Legislature or public that do not distinguish between types of land use or level of impact would likely be perceived as illogical and unfair. This could become a fatal flaw for the Access Management Program as a whole. Incorporation of Type B Access standards should make the program much more acceptable to the public and feasible for the Cabinet to carry out.

This revised approach was well received, and the discussion then focused on the issue of what the Type B spacing standards should be. Two scenarios were presented. One scenario was based on standards that ranged from 300 ft. for Class 1 to 100 ft. for Class 4 for urban highway classes; and ranged from 300 ft. to 150 ft. for rural classes. The other scenario allowed one-half the Type A spacing on Class 3 and 4 (or also including Class 2) facilities, but applied the Type A standard to all access on Classes 1 and 2 (or Class 1 only). For either scenario the following proposed notes/conditions would apply:

- a. Type B access spacing utilized only if alternative reasonable access meeting Type A standards is not feasible
- b. Change to non-Type B use requires new permit and application of Type A standards
- c. Only one access allowed per parcel or for contiguous parcels under one ownership
- d. Type B access not allowed within the functional area of another intersection
- e. When median is present access will be limited to right turns only
- f. Combined access is strongly encouraged.

A discussion of the Type B spacing options followed. The primary argument in support of the second scenario was that Type B spacing would be applied on approximately 70 - 85% of the mileage in the state (depending on whether Type A spacing is held firm for Classes 1 and 2 or Class 1 only). For the remaining mileage, representing the state’s most important roadways, traffic mobility and safety should be protected with the higher Type A standards. The primary arguments in support of the first scenario were that it could be perceived as

unfair to “penalize” those who owned property along Class 1 or Class 2 routes. And, because land uses that qualify for Type B spacing would generate 6 or fewer trips in the peak hour, it is difficult to make the argument that safety and traffic flow would be substantially impacted by the lesser spacings. It was also pointed out that even the lesser Type B standards amount to an improvement over what has occurred in the past along many sections of roadway. After a lengthy discussion, a consensus was reached that the scenario that allowed reduced spacing for Type B access on all routes should be the preferred approach. The Type A and Type B spacing standards that were accepted for use are shown in the table that follows.

Unsignalized Intersection Spacing Standards

Access Class	Typical FC	Type A Access	Type B Access
Urban I	Principal Arterial	1,200/600	300
Urban II	Minor Arterial	450	150
Urban III	Collector	300	150
Urban IV	Local	150	100
Rural I	Principal Arterial	1,200	300
Rural II	Minor Arterial	600	300
Rural III	Collector	450	150
Rural IV	Local	150	150

5. Several additional comments were made by members of the group during the discussion of standards for unsignalized intersection spacing. These are summarized generally by the points listed below (and in some cases were left as unresolved issues).
 - Incorporation of Type B Access standards should substantially reduce the number of situations that would require a waiver to the standards.
 - Type B standards will likely reduce access points by about half, compared to what has occurred in the past (per Scott Coppage).
 - Routes for which the Cabinet now maintains Partial Control of Access may warrant special consideration. Should we allow Type B access on those facilities?
 - The proposed condition for Type B access that only one access point would be allowed per parcel, or for contiguous parcels under one ownership, represents an ideal that may be very difficult to enforce in many commonly occurring situations. More thought is needed on this.

6. Scott Coppage reported on progress that has been made on the manual review of the access management classification system assignments for the counties in District 4. He said that the work was progressing well (six counties completed) and that it had not been too much of a burden. He said that the most common situations where the District is recommending changes to the computer generated classifications were “Main Street” through small towns (the assigned class is typically high because of the functional classification of the route, but

the surrounding land use is very dense and access needs suggest a lower class) and isolated short sections that needed to be changed for system continuity.

7. Brent Sweger discussed his desire to finalize remaining standards at the next task force meeting. He requested that task force members review, in particular, the standards that have been proposed for ramp terminal/intersection spacing.

A.10 Access Management Implementation Task Force Meeting No. 10

The 10th meeting of the Access Management Implementation Task Force was held on April 7, 2005. Attendance was as follows:

KYTC Members

David Beattie, District 8 (Pre-Construction)
Ananias Calvin, Design
Scott Coppage, District 4 (Permits)
Steve Farmer, District 7 (Operations)
Dana Fugazzi, General Counsel
Tom Kerns, Right-of-Way
Chad Larue, Permits
Brent Sweger, Multimodal Programs
Duane Thomas, Traffic

Kentucky Transportation Center

Barry House

Others

Marc Williams, Commissioner of Highways
Lynn Soporowski, Multimodal Programs
Greg Rawlings, FHWA

1. The following access management news items were reported by members of the task force:
 - The Cabinet's Highway Design Manual has been updated to include a new chapter on access management. A Design Memorandum was issued on April 5, 2005, in order to trigger the policies contained in this chapter.
 - Brent Sweger conducted a training session on access management for the Kentucky League of Cities. Interest in access management from local governments is gaining momentum.
 - The Lincoln County fiscal court has adopted an access management ordinance based on KYTC's Model Local Ordinance. The significance of this action by a county that does not have county-wide planning and zoning was questioned.
 - Boyle County has expressed interest in adopting an access management ordinance. Brent Sweger will do a presentation.

- The Metropolitan Planning Organization for the Radcliff-Elizabethtown area will do an access management study for the US 31W corridor as a part of their work program for next fiscal year. The study will be conducted by a consulting firm, and it will focus on identifying access management retrofit projects for the corridor.
 - A corridor study focusing on access management is being conducted for KY 53 in LaGrange.
2. Scott Copping gave a report on the effort recently completed in District 4 to manually review the computer-determined access management classification assignments. Scott reported that a small group of district staff including the Permitting, Planning, and Traffic functions was assembled to discuss each county, one at a time, over the course of about 5 weeks and that a couple of hours were spent on each county. The District found that the vast majority of the computer assignments were logical and reasonable and recommended changes on only about 5% of the sections. The recommended changes, which included both downgrades and upgrades, were primarily for route continuity purposes or to establish a more logical point for a change in class. The most significant dilemma encountered was deciding on the proper treatment of the main route through small towns.
 3. Chad Larue reported on the efforts to date by the Permitting team. He explained that substantial progress has been made on flowcharting an enhanced process that will incorporate formal waiver and appeals procedures. Chad explained that the team is currently focusing on the issue of who should be responsible for the various decisions that have to be made (Central Office vs. District, level of responsibility, staff involved, etc.) and how the process and decision-making should differ for major versus minor deviations from the standards.
 4. Marc Williams addressed the group. He said that the Secretary's and Commissioner's offices are supportive of the concept of access management and that the work of the task force is important. He said that the task force should continue to work through the details of the implementation process and complete a set of recommended procedures and standards, but that the Cabinet is not prepared for full-scale implementation. He cautioned that there will be some resistance to these changes, to which the Cabinet should be sensitive, and that the access management implementation effort should not try to make too many changes too soon. He further cautioned that publicity and negative reaction could potentially derail the program before we have all the details worked out. He suggested that the task force should devise a strategic, incremental approach to implementation. Such a strategy might involve phased implementation with new construction, cooperatively developed corridor specific improvements, and (especially) locally initiated policies. Mr. Williams also stated that it will be important to have facts and documentation of the benefits of access management to Kentucky before we begin the public involvement that would precede full-scale implementation efforts.
 5. Brent Sweger led a discussion of access management standards. A handout was presented which showed the most current proposed standards and identified recent changes, pending issues, and completion status. The highlights of this discussion are summarized in the points below:

- Recent revisions to the Signalized Intersection Spacing Standards for the Urban III, Rural III, and Rural IV classes that resulted from the February and March task force meetings were discussed. The group was in agreement, and these standards are now considered to be complete.
- The Median Type Standards were finalized in November. With no revisions or pending issues, these standards are now considered to be complete.
- Changes to the originally proposed Median Opening Spacing Standards that resulted from an appraisal of recent research findings and discussions at the February and March task force meetings were reviewed with the group. The recommended changes and supporting notes were accepted. Discussion at this meeting dealt primarily with the dual standards for Urban II facilities and problems that could result from basing an allowed reduction in spacing on the posted speed limit (as happens now with partial control of access facilities). It was decided that wording should be developed to make the lower spacing standard a “permitted when necessary” type of provision rather than an absolute reduction and to base the criteria for the dual standard on the 85th percentile speed rather than posted speed limit.
- The proposed Unsignalized Intersection Spacing Standards received considerable discussion, mostly related to the proposal introduced at the March task force meeting to distinguish between types of access in the standard. The revised standard now applies the originally proposed spacings to “Type A” access, while “Type B” access requests could qualify for significantly reduced spacing. Type B land uses would include single-family dwellings, multiple-family dwellings of three units or less, and farm/field access. Access Type A would include all commercial access, residential subdivision access, and any land use not included in Type B. Barry House explained that this approach was developed in response to concerns that the previously proposed standards did not distinguish between types of land use or level of impact and essentially treated all applicants the same, and also concerns that the initially proposed standards were too restrictive for negligible impact land uses. He stated that presentation of standards to the Legislature or public that do not distinguish between types of land use or level of impact would likely be perceived as illogical and unfair. This could become a fatal flaw for the Access Management Program as a whole. Incorporation of Type B Access standards should make the program much more acceptable to the public and feasible for the Cabinet to carry out.

The proposal to include provisions in the standard for access type was generally accepted, with most of the discussion dealing with the qualifying notes for Type B access and the amount of reduction in spacing that should be allowed. There was much discussion of whether Type B access should be allowed on routes where the Cabinet currently maintains partial control of access, and this remains as a pending issue. There was also some sentiment that the reduction in spacing allowed for Type B access was too great, especially for higher class facilities. One suggestion was that it would make sense to set the spacings for Type B to be one-half the spacings for Type A access. This remains as a pending issue for further discussion at the next meeting.

- Time did not permit any substantial discussion of the Corner Clearance, Freeway Interchange Spacing, or Freeway Ramp - Intersection Spacing Standards. Decisions on these standards were deferred to the next meeting.
6. Brent Sweger discussed his desire to finalize remaining standards at the next task force meeting. He requested that task force members review, in particular, the standards that have been proposed for ramp terminal/intersection spacing and forward comments prior to the meeting.

A.11 Access Management Implementation Task Force Meeting No. 11

The 11th meeting of the Access Management Implementation Task Force was held on June 2, 2005. Attendance was as follows:

KYTC Members

David Beattie, District 8 (Pre-Construction)
 Ananias Calvin, Design
 Scott Coppage, District 4 (Permits)
 Steve Farmer, District 7 (Operations)
 Dana Fugazzi, General Counsel
 Tom Kerns, Right-of-Way
 Chuck Knowles, Operations
 Brent Sweger, Multimodal Programs
 Duane Thomas, Traffic

Kentucky Transportation Center

Barry House

Others

Sheree McDonald, Maintenance - Permits
 Greg Rawlings, FHWA

1. The following access management news items were reported by members of the task force:
 - Brent Sweger reported that he conducted a training session on access management in Danville that included persons from Boyle, Franklin, and Anderson Counties. Boyle County is interested in adopting an access management ordinance.
 - Brent reported that he has been asked to do a presentation on access management for the Kentucky chapter of the American Public Works Association.
 - A proposed mega RV center at the I-65/KY 100 interchange in Simpson County was discussed. Access management concerns have played a major role in design options that have been considered for improvement of this interchange. The current preferred option includes a nontraversable median on KY 100 in the vicinity of the interchange.

2. Barry House led a discussion of interchange area access management issues. He stated that after reviewing some recent literature (NCHRP Synthesis 332 – Access Management on Crossroads in the Vicinity of Interchanges) he has concluded that the interchange area spacing standards proposed in the *Access Management for Kentucky* research report may not be the most appropriate for Kentucky’s program. It was explained that the recommendations in the research study were copied from the TRB Access Management Manual and that they are probably overly detailed and unnecessarily cumbersome for application in Kentucky, since they include spacings related to design features that are not utilized extensively in Kentucky (directional medians).

A handout showing the following list of factors that influence the distance downstream of an interchange ramp terminal at which access to the crossroad can be permitted was discussed.

Factors influencing distance downstream of an interchange ramp terminal at which access to crossroad can be permitted:

- a. Surrounding land use and environment (urban vs. rural) - Required spacing in rural areas typically longer because of higher speeds and lower land use densities.
- b. Classification of crossroad - Priority for mobility vs. access and other access spacing factors (speed, volume, cross section, etc.) are encapsulated within this single factor.
- c. Interchange Type (free-flowing ramp vs. ramp intersection)
 - Free-flowing ramps require more stringent spacing standards because of uncontrolled weaving maneuvers.
 - At signalized or STOP-controlled ramp intersections weaving is not a factor because vehicles can transition into desired lane during initial turning movement.
- d. Type of downstream access point (right-in/right-out vs. unsignalized full access vs. signalized intersection) - Distance needed for driver decisions and vehicle maneuvers depends on complexity of movement.
- e. Downstream storage requirements - Queue storage must be added to decision and maneuver distances to insure adequate spacing.
- f. Cross section of crossroad - Weaving distance (to first left-turn access) depends on number of lanes to be traversed.
- g. Design speed of crossroad - Distance needed for driver decisions and vehicle maneuvers depends on speed of travel.
- h. Sight distance on crossroad
 - Stopping Sight Distance should be maintained as a minimum distance between interchange terminal and crossroad access locations to ensure that motorists are not placed in situations where they would not have time to avoid a vehicle decelerating or

- stopping to turn from crossroad or a vehicle entering the crossroad from an access point.
- In areas where there is a high potential for unexpected maneuvers or where information is difficult for drivers to understand, the longer Decision Sight Distance may be needed.
- i. Traffic volumes - Number of traffic conflicts depends on crossroad and access point volumes.

It was noted during this discussion that the only design standard related to interchange area spacing currently utilized by KYTC is that contained in AASHTO's 1991 "A Policy on Design Standards – Interstate System", which recommends that access control be extended beyond the ramp terminal for a minimum of 100 ft. in urban areas and 300 ft. in rural areas. It was suggested that the AASHTO policy is probably intended to mean that agencies should purchase ROW or access control within these distances, not that it should be acceptable to allow access connections at these distances (although this has tended to be the practice). Further discussion of interchange area spacing standards was deferred to the July task force meeting.

3. The Interchange Spacing Standard (spacing from interchange to interchange along freeway) that had been discussed previously, but not formally accepted, was presented for consideration by the group. With no revisions or pending issues, this standard was accepted and is now considered to be complete.
4. The proposed Unsignalized Intersection Spacing Standards received considerable discussion, mostly related to the definition of access types. The revised standard now applies the originally proposed spacings to "Type A" access, while "Type B" access requests could qualify for significantly reduced spacing. As proposed, Type B land uses would include single-family dwellings, multiple-family dwellings of three units or less, and farm/field access. Access Type A would include all commercial access, residential subdivision access, and any land use not included in Type B. A suggestion was made that Type B access should include only single-family residences and farm entrances. This suggestion was based on the current distinction between "private" and "commercial" driveways in the Permits Guidance Manual. The primary argument against the single-family limit was that one of the principles of access management is to encourage shared access and including up to three residences within the definition of Type B access would serve that objective. It was also noted that the difference in traffic impacts between driveways serving one versus three residences would be negligible. After discussing pros and cons and other possible definitions, the task force decided to accept the definition allowing up to three residential units.

The task force also discussed the spacing standards for Type B access and a suggestion that the Type B spacings be set at one-half the Type A spacings. This suggestion was based on a concern that the proposed spacings were too much of a compromise, especially for routes where the Cabinet currently has partial control of access. The primary arguments in favor of the originally proposed spacings were that these spacings should be more workable in that they were more consistent with typical lot sizes, and that they represented an earnest attempt

to incorporate the maximum flexibility that the Cabinet could allow for negligible impact situations. After much discussion the task force decided to accept the originally proposed spacings for Type B access, with the condition that Type B access would not be allowed on partial control of access routes.

5. Brent Sweger discussed the need to finalize the standards at the next task force meeting. He requested that task force members review, in particular, the issues related to interchange area spacing and forward comments prior to the meeting.

A.12 Access Management Implementation Task Force Meeting No. 12

The 12th meeting of the Access Management Implementation Task Force was held on July 7, 2005. Attendance was as follows:

KYTC Members

Ananias Calvin, Design
Annette Coffey, Planning
Steve Farmer, District 7 (Operations)
Dana Fugazzi, General Counsel
Chuck Knowles, Operations
Brent Sweger, Multimodal Programs
Duane Thomas, Traffic

Kentucky Transportation Center

Barry House
Adam Kirk
Nick Stamatiadis

1. The following access management news items were reported by members of the task force:
 - Brent Sweger reported that he has been contacted by the City Manager of Winchester. They are interested in adopting an access management ordinance. Brent will meet with them to assist.
 - The agenda for the 2005 FHWA KYTC ACEC-KY Partnering Conference includes a presentation on nontraversable medians and U-turn movements at mid-block median openings.
2. Brent summarized the accomplishments from the June task force meeting. He informed the group that the Unsignalized Intersection Spacing Standards, which had been discussed at several previous meetings, were now considered to be complete. Ananias Calvin stated that the Director of the Division of Highway Design had reviewed these standards, and he had mentioned that he thought the revision for Type B access was a good idea.
3. Chuck Knowles informed the group that he wanted the task force to present the spacing standards to the Commissioner and State Highway Engineer as soon as possible so that decisions could be made on how to proceed with implementation. It was discussed that the

standards should be finalized by mid-August, but that it would be prudent to have made some progress on determining how the variance process will work before this meeting. It was decided to plan for having this presentation in late September.

4. Barry House led a discussion of interchange area access management issues. The first issue considered was how spacing between the ramp terminal and the first access point should be measured. A handout that was previously emailed to the attendees, which illustrated the different options and summarized the practices of other states was referred to during this discussion. Four options for defining the ramp terminal (ramp centerline, gore point, end of radius, and end of taper) and two options for referencing the location of the access connection (centerline and nearest edge of pavement) were discussed. Barry explained that there is little consistency among other states on how this is done and that neither the TRB Access Management Manual nor the recent Access Management on Crossroads in the Vicinity of Interchanges NCHRP study make a recommendation on a preferred method. It was pointed out that illustrations in the Cabinet's Design Manual show a "Minimum" spacing measured from the ramp end of radius to the access connection centerline and a "Desirable" spacing measured from the ramp end of taper to the access connection centerline. Problems with referencing the location of the access connection to the centerline for wide driveway or street intersections were readily apparent to the group, and it was decided that the nearest edge of pavement should be used – this being a reference that is generally easy to identify and the point at which right turns occur and left-turn queues begin to form. After a more lengthy discussion related to defining the reference point for the ramp terminal, it was decided that the end of taper should be used for ramp designs that incorporate use of a taper; where no taper is present, the end of radius should be used – this being the point at which traffic is no longer on the ramp and has entered the crossroad traffic stream.
5. The appropriate spacing for different types of interchange area access connections was the next issue taken up by the group. Barry House opened the discussion by saying that the group should recognize from the start that interchange areas are complicated to deal with from an access management perspective and that, as a matter of practical necessity, the standards selected will have to be a compromise between engineering principles and the access needs of the surrounding land use environment. In most cases it will not be realistic for the Cabinet to set access spacings to provide the full desirable distances associated with each decision-making process and vehicle maneuver. On the other hand, in order to keep interchange areas from becoming major traffic bottlenecks, the Cabinet will have to set standards that will likely be viewed a very restrictive by developers. The chart below was passed out and considered by the group. It was explained that this proposed revision to the standards presented initially in the *Access Management for Kentucky* report was developed with this compromise philosophy in mind, and it is also intended to be a simplification of the initial proposal.

Interchange Area Spacing Standards(1)

Access Class	Typical FC	Nearest Major Intersection (2)	Nearest Access Connection (3)	Right-In/Right-Out Only Access (4)
Urban I	Principal Arterial	2,400	1,200	450
Urban II	Minor Arterial	2,400	900	450
Urban III	Collector	1,200	600	300
Urban IV	Local	1,200	600	300
Rural I	Principal Arterial	2,400	1,200	600
Rural II	Minor Arterial	2,400	900	450
Rural III	Collector	1,800	600	450
Rural IV	Local	1,200	600	300

- (1) Spacing measured from [to be determined] to access connection closest edge of pavement
- (2) Distance to first four-way intersection. Beyond this point spacing standards based on crossroad access class apply.
- (3) Distance to first full movement access connection (right- or left-side, but not both).
- (4) Applicable where left-turn movements restricted by median barrier.

Notes:

Type B access spacing not permitted with between ramp and first major intersection.

- Signalized intersection spacing. These distances may be too great for U2, R2
- One-half major intersection spacing
- Decision sight distance for speed/path/direction change for 45 mph urban street = 930 ft.
- Decision sight distance for 35 mph urban street = 720 ft. (30 mph = 620 ft)
- Decision sight distance for speed/path/direction change for 55 mph rural road = 865 ft.
- Decision sight distance for 45 mph rural road = 675 ft. (40 mph = 600 ft)
- Stopping sight distance for 60 mph = 570 ft.; 55=495; 50=425; 45=360; 40=305; 35=250

Initially there was some confusion with the “Nearest Major Intersection” terminology, and the group decided to refer to this type of access connection as the “Nearest 4-Way Intersection”. It was also decided that the spacing for access classes UII and RII could be reduced to 1,800 feet and the spacing for class RIII could be reduced to 1,200 feet. Concerns were also expressed over the “Nearest Access Connection” standard and the practicality of restricting access on one side of the road because of a prior granting of access on the other side. After considerable discussion, it was decided that this type of access connection should be limited to right-in/out and left-in movements but that it could apply to both sides of the road. The tabulated distances were judged to be appropriate for this type of access, with a stipulation that there would have to be provisions for adequate left-turn lanes before this type of access could be allowed. The group then discussed “Right-In/Right-Out Only Access”. All were in agreement with this concept, and the only recommended change in the tabulated distances was to increase the spacing for the UI class to 600 feet. It was also suggested that a note should be added to prohibit this type of access connection within the limits of the ramp taper or an auxiliary lane for a downstream intersection.

- 6. Brent Sweger informed the group that an offer of assistance had been received from an attorney (David Pike) that has expertise in planning and zoning issues. It was reported that preliminary discussions with Mr. Pike and Pat Lafferty, a planner on his staff, of access related legal and procedural issues were informative. A noteworthy conclusion that has come from these discussions relates to the issue of future land subdivisions that might be inconsistent with access spacing standards (an issue that has been a major concern for members of the task force at previous meetings). More specifically, the feasibility of

imposing the following requirement was discussed: “After the effective date of this regulation, no additional access will be allowed if existing parcels, or contiguous parcels under one ownership or control, are split or divided – unless such access would meet the requirements of this regulation. Otherwise, all access to the new parcels will be provided internally from the existing access.” Mr. Pike is of the opinion that this requirement would be feasible and is, in fact, necessary. Without such a requirement, the Cabinet would essentially be allowing access spacing to be determined by third-party actions. Land subdivisions that are inconsistent with a properly executed regulation would fall under the legal umbrella known as “buyer beware”, and the Cabinet would not be obligated to provide access in such situations.

7. The meeting concluded with an understanding that the access spacing standards were now nearly complete, and the group should be prepared to finalize the standards at the August meeting.

A.13 Access Management Implementation Task Force Meeting No. 13

The 13th meeting of the Access Management Implementation Task Force was held on August 4, 2005. Attendance was as follows:

KYTC Members

Ananias Calvin, Design
Scott Coppage, District 4 (Permits)
Chad Larue, Permits
Brent Sweger, Multimodal Programs
Duane Thomas, Traffic

Kentucky Transportation Center

Barry House
Adam Kirk

Others

Lynn Soporowski, Multimodal Programs

1. The following access management news items were reported by members of the task force:
 - Brent Sweger reported that over the past month he has made presentations related to access management to the Green River Area Development District regional transportation committee, the Kentucky Chapter of the American Public Works Association, and the City of Winchester public works committee.
 - Consultants have been selected and negotiations of scope/fee are underway for access management corridor studies for KY 53 in LaGrange and US 31W in Hardin County. Also, the Division of Planning has initiated a study for US 25 in London that will emphasize access management strategies.

2. Brent reported that standards related to interchange area spacing and corner clearance were accepted at the July meeting and that the task force had now completed the initial review and refinement of the proposed standards for each of the access management control strategies recommended in the *Access Management for Kentucky* research report. At that point the Transportation Center reviewed the standards as a whole and looked for cases where there were inconsistencies and for situations where the spacing distances did not line up with each other as logically as they should. Barry House led a discussion of the following four situations for which adjustments were recommended.

- For median openings on Class R1 facilities, a spacing of 2,400 feet was selected for both full and directional median openings. For all other classes the spacing for directional openings was set at one-half (or less) of the full opening spacing. This was felt to be an oversight, and it was recommended that the allowed spacing for directional openings be changed to 1,200 feet.
- For Class R2, spacing standards have been set at 2,400 feet for signalized intersections and full median openings, 800 feet for directional median openings, and 600 feet for unsignalized intersections. It would be more logical to set the directional median opening spacing at 1,200 feet (half the full/signalized, twice the unsignalized) instead of 800 feet.
- For Class U3, spacing standards have been set at 1,200 feet for signalized intersections and full median openings and 300 feet for directional median openings and unsignalized intersections. It was recommended that full median openings be allowed at a reduced 600 ft. spacing (half the signalized, twice the unsignalized) for this classification that places an equal emphasis on access and mobility – under the assumption that traffic volumes would not warrant signalization at most U3 median openings.
- For Class U2, spacing standards have been set at 2,400 feet for signalized intersections, 2,400/1,200 feet for full median openings, 1,200/600 feet for directional median openings, and 450 feet for unsignalized intersections. It was recommended that the unsignalized intersection spacing be set at an even division of the longer spacings (600 feet). This same change would also be applied to the corner clearance standards, which incorporate the same minimum spacings as the unsignalized intersection standards.

After considerable discussion, each of these recommendations was accepted by the group.

3. Brent Sweger explained that the next major task to be undertaken by the task force would be the development of a variance or waiver process to deal with deviations from the standards. It was stressed that a fair and well-conceived variance process would be critical to continued Administration support and public acceptance of the program. Barry House gave a presentation that explained the need for a variance process, the principles involved, and the issues that the task force will have to resolve. This presentation is summarized below.

Need for Variance Process

- Some flexibility is required in administration of access management regulations.
 - Existing access points and property frontage create constraints
 - Impossible to anticipate and cover all conditions to be encountered
 - Complexities may require alternative treatments
- Unconditional application of minimum standards is not appropriate for all cases
 - Negligible impact situations
 - Unjustified hardship on property owner
 - Special, unique, or complex situations
- Fair and well-conceived variance process will be critical to Administration support and public acceptance

Variance Process

- Level 1
 - Requests with negligible impact on highway operations and safety
 - Basic information and documentation of decision
 - Decision at District level
- Level 2
 - All other deviation requests
 - Requires more extensive review and justification
 - Decision at Central Office

Variance Process – Basic Rules

- Process must be clearly understood and applied consistently to all applicants
- KYTC should follow same process as individual applicants when deviating from access management standards for highway projects
- Documentation essential

Issues for Task Force to Resolve – Terminology

- Variance vs. Waiver vs. Deviation
- Same terminology for both variation from standard and process that handles
 - Level 1/Level 2 Variance (Waiver), or
 - Minor/Major Deviation
- Separate terminology for variation/process
 - Minor/Major Deviation from standard and Level 1/Level 2 Variance (Waiver) Process

Issues – Distinction between Minor/Major

- Base on amount of deviation
- Base on trip generation - ?
- Vary by roadway classification - ?
- Certain situations always Minor or always get Level 1 treatment - ?
- Certain situations always Major or always get Level 2 treatment - ?

Issues – Staff Responsibilities

- District staff for Level 1 review and recommendation
- District staff for Level 1 decision (Committee preferably)
- Central Office/District staff for Level 2 review and recommendation
- Central Office staff for Level 2 decision (Committee preferably)

Process Components

- Introduction, general philosophy, definitions, application procedures, review/decision making procedures, appeal procedures
- Resolution of issues (listed above)
- Decision guidelines
- Supporting rules

General Philosophy – Examples

- Justified; Physical site restrictions; Special conditions
- Consistent with purpose of access management regulations; Public purpose
- Undue/exceptional hardship; Denial of reasonable access; No alternative access available
- No safety or operational problems

Decision Guidelines

- Needed to promote consistency between Districts and between Central Office and Districts
 - List of factors to be viewed favorably (list of conditions warranting increased flexibility)
 - List of unfavorable conditions

Supporting Rules – Example 1

Potential land-locking caused by land subdivision and resale (after the effective date of this regulation) is the result of such subdivision process and will not alone justify variances or deviations in the spacing requirements contained in this manual. Therefore, as part of the subdividing process, the party proposing the subdivision and the local government approving such subdivisions should require and provide some type of internal access easements to the

existing access connection points or to such access connection point locations that qualify for future permits based on this manual's spacing requirements. (Texas AM Manual)

Supporting Rules – Example 2

Variations shall not be granted because of conditions precluding the adherence to the regulation that are self-created by the owner(s) or previous owner(s) of the property. This includes existing or proposed site layouts that prohibit adherence to standards that would otherwise be possible.

Appeals Process

- Administrative process that must occur before applicant can resort to legal action
 - Denial of permit/variance or unacceptable permit condition
 - Appeals Committee, Board/Commission, Hearing Officer
 - Hardship/economic loss justification weighed against intent of regulation and impact on roadway operations
5. Brent Sweger concluded the meeting by informing the group that a subcommittee would be set up to begin working on parameters and details of the variance process. The subcommittee's recommendations would be brought before the full task force.

A.14 Access Management Implementation Task Force Meeting No. 14

The 14th meeting of the Access Management Implementation Task Force was held on October 6, 2005. Attendance was as follows:

KYTC Members

Ananias Calvin, Design
Steve Farmer, District 7 (Operations)
Daryl Greer, Planning
Chuck Knowles, Operations
Chad Larue, Permits
Brent Sweger, Multimodal Programs
Duane Thomas, Traffic

Kentucky Transportation Center

Barry House
Adam Kirk

1. Brent Sweger reported that a meeting had been set up for October 10 with Commissioner Marc Williams to provide him with a briefing on the progress that the task force has made. In particular, the recommended standards and proposed variance process are to be discussed with the Commissioner.

2. Brent informed the group that a team (Sweger, Larue, House, Kirk) had been working on an outline for the variance process. Adam Kirk gave a presentation on ideas and recommendations that the team was putting forward for the task force's consideration. This presentation is outlined below.

Permit Application Requirements

- Site plan identifying proposed access location
- Vicinity map identifying adjacent access points and roadways
- Type and size of proposed development
- Type of proposed access (Type A or Type B)
- Other access related modifications (signal, median opening, etc.)
- Proposed roadway modifications/improvements
- Documentation of adequate sight distance
- Additional information or analysis as may be required by District Permit Engineer

Permit Application Review

- Does the application provide adequate information to understand the request and the type/size of the development (including full build-out potential)
- Are access management requirements and standards met
- Is a Traffic Impact Study required
- Is a Variance from the standards required

Variance Process – Basic Structure (Two Levels)

- Minor Variance
 - Requests with minor deviation from standard and negligible impact on highway operations
 - Basic information (extent, reason) and documentation of decision
 - Review/Decision/Appeal at District level
- Major Variance
 - Significant deviation from standard and potential for significant impact
 - Requires more extensive review and justification (Traffic Impact Study)
 - Review/Decision at District; Appeal to Central Office

Variance Process – Minor Variance

- Criteria
 - All variances involving Type B Access
 - Classes I & II: Deviation from standard $\leq 15\%$
 - Classes III & IV: Deviation from standard $\leq 25\%$
 - Trips generated < 100 vph for peak hour
 - No alteration of traffic signal control on adjacent roadway

- Burden of Proof
 - No existing access to site, or the request would replace an existing access point and improve safety and/or operations
 - Necessary due to a pre-existing condition and not due to action by current property owner/applicant
 - No reasonable engineering or construction alternatives to provide access to site which would meet or be in closer compliance to the standard
 - Adequate sight distance

Variance Process – Major Variance

- Criteria
 - All variance requests that do not meet criteria for minor variance
- Burden of Proof
 - Same as minor variance, plus following to be established by traffic impact study (TIS)
 - Level of safety and operational performance would be comparable to that provided with full adherence to access management standards
 - Traffic operations and safety will not be degraded to unacceptable level by proposed development and access plan

Permit Application Review and Decision Making

- No Variance
 - Review/Decision: District Permit Engineer
- Minor Variance
 - Review/Decision: District Permit Engineer
- Appeal of denial of Minor Variance
 - First appeal to District Permit Committee (Chief District Engineer and two merit managers)
 - Second appeal to Administrative Hearing (KRS 13B)
 - Appeal of Administrative Hearing decision would go to District Court

Permit Application Review and Decision Making (continued)

- Major Variance
 - Review: District TIS Review Committee (Assistant Chief District Engineer, Traffic Engineer, Permit Engineer)
 - Decision: District Permit Committee (Chief District Engineer, two merit managers)
- Appeal of denial of Major Variance
 - First appeal to Central Office Access Management Review Committee (State Highway Engineer’s Office, Traffic Operations, Design, Permits, Planning)
 - Second appeal to Administrative Hearing (KRS 13B)
 - Appeal of Administrative Hearing decision would go to District Court

During the course of the presentation numerous points/questions were raised by task force members. These are summarized below.

- It may not be practical to require that applicants provide documentation of adequate sight distance. Would a professional engineer or licensed surveyor be required? Sight distance would likely have to be verified by the Cabinet, even if provided by the applicant. A suggestion was made that the Cabinet should determine sight distance for Type B access requests but require that the applicant provide documentation for Type A access requests.
- A Variance request form will need to be developed.
- The Cabinet should have the right to require microsimulation, if warranted, as part of the TIS requirements.
- A TIS could reveal that a development for which access is being requested produces negative operational impacts on intersections that are some distance from the access point. Can the Cabinet require improvements in such cases? The Cabinet should have the ability to charge impact fees in cases where development/access related improvements are needed off-site, but the applicant doesn't have the ability to address (for example, if right-of-way would have to be acquired).
- The makeup of the District Permit and District TIS Review Committees would likely vary from District to District because the District Offices are staffed differently with respect to the Permits, Traffic, and Operations functions.
- What is the role of the Central Office on access management decisions that are made at the District level? Policies/procedures should allow (or encourage) Districts to seek assistance from the Central Office as needed.
- How do we achieve consistency from District to District? The Central Office would have to serve in a quality control role.
- Currently the Central Office has authority over all traffic signal installations. It was the general consensus that this authority should be retained. Access requests that involve signal installation or modification would have to undergo a concurrent review/approval that is outside the permitting process.
- The issue of who has the ultimate signature approval authority for different situations (permit, variance, appeal) will need to be resolved.

3. Brent Sweger informed the group that the Transportation Center had performed some additional research related to the choice of median type for different situations, and that they had developed some additional guidelines to offer for the task force's consideration (a technical paper titled Rationale for Median Type Recommendations had been provided to task force members before the meeting). Adam Kirk presented and led a discussion of the recommended guidelines, which are listed below. After considerable discussion these guidelines were accepted by the task force to supplement to the Median Type Standards that had previously been developed.

Median Type Guidelines

Individual left-turn lanes recommended for:

- Locations where left-turn volume exceeds warrant (to be determined), and
- Access point density ≤ 10 ap/mi (access points per mile)

TWLTL generally appropriate for:

- Urban/suburban 2-lane roadways with:
 - projected ADT $< 17,000$ vpd
 - access point density > 10 ap/mi and < 85 ap/mi
 - left-turn volume < 150 vph
- Urban/suburban multi-lane roadways with:
 - projected ADT $< 24,000$ vpd
 - access point density > 10 ap/mi and < 85 ap/mi
 - left-turn volume < 100 vph

Nontraversable medians recommended for:

- All new multilane arterials
- Existing roadways where ADT, access density, and/or turning volumes exceed thresholds established above for TWLTLs
- Existing rural multilane arterials
- Crossroads in the vicinity of interchanges
- Multilane roadways with high pedestrian activity

Notes:

3. Traversable raised medians are not recommended since they neither facilitate left turns nor do they provide positive control over left turn movements.
4. If a project design team determines that a different median type is needed for safety or traffic operational reasons, a variance may be requested.

A.15 Access Management Implementation Task Force Meeting No. 15

The 15th meeting of the Access Management Implementation Task Force was held on August 3, 2006. Attendance was as follows:

KYTC Members

Kelly Baker, District 7 (Permits)
David Beattie, District 8 (Pre-Construction)
Ananias Calvin, Design
Steve Farmer, District 7 (Operations)
Daryl Greer, Planning
Chuck Knowles, Operations
Tom Napier, Permits
Brent Sweger, Planning
Duane Thomas, Traffic

Kentucky Transportation Center

Barry House
Adam Kirk

Others

Lynn Soporowski, Planning
Greg Rawlings, FHWA

1. Chuck Knowles reported that the current status of efforts to implement the Cabinet's proposed Access Management Program had been discussed recently during an executive staff meeting. At this meeting Commissioner of Highways Marc Williams requested that certain on-going efforts be put on hold. Included were the following:
 - Development of a Design Policy that would require application of new Access Management Standards on at least one alternative in conceptual design.
 - Development of a Median Policy that would guide highway designers on the use of medians, the choice of median type, and the location/type of median openings and provide guidance and standards for the consideration of permit requests at locations that involve medians.
 - Adoption of formal access spacing standards in the Cabinet's access permitting procedures.

A lengthy discussion of the impacts of this decision on the implementation of access management in Kentucky followed. It was explained that the Commissioner is still supportive of the philosophy and practice of access management, but he feels that the timing is not right to pursue the adoption of formal policies. Commissioner Williams did support the following activities:

- Completion of the statewide access management classification system.
- A review of the access permitting process.
- Discussions to improve coordination between the Cabinet and local Planning & Zoning.

- Application of access management principles and standards to selected pilot projects; especially studies that are locally initiated or projects that have strong local support for access management improvements.

It was also suggested that the Task Force should endeavor to integrate access management into the mindset of project design teams.

2. Brent Sweger informed the group that he and Barry House had been exploring the idea of pursuing Access Management Memorandums of Understanding (MOUs) between the Cabinet and local governments. A MOU could potentially be used as a tool in certain cases to either ensure that the recommendations of an access management study are supported by access permitting and development plan actions or that access management modifications that are implemented as a part of a highway improvement project are not jeopardized by such actions. Prior to now, such an agreement has not been utilized in Kentucky for this purpose, but it is believed that an Access Management MOU would be very similar in many respects to the various maintenance agreements that are routinely executed between the Cabinet and local governments. Brent noted that this has been done in other states. It was reported that a meeting with the Cabinet's legal staff had been held to discuss this idea, and that additional discussions would take place soon.
3. Barry House gave a progress report on statewide access management classification system effort. A manual review of the preliminary access management classification system (classes assigned by computer based on functional classification, traffic volume, and posted speed limit) has been underway since December. Refinements have been recommended by District Office review teams based on factors that could not be included as part of the initial data driven assignments (such as adjacent land use and planned highway improvements) and to ensure appropriate system continuity and logical break points. Data lists and GIS maps were supplied, and each District team received training on factors to consider and potential adjustments that could be made. Barry explained that the review required approximately one to two hours per county (somewhat more for urbanized counties), and that the work has been completed in 10 of the 12 districts. Changes (classification upgrades or downgrades) were recommended for about 8.5 percent of the 22,000+ miles reviewed. Once all reviews are completed and the system is finalized, the access management classification system will be maintained in the Cabinet's Highway Information System (HIS) database by the Division of Planning.
4. Chuck Knowles informed the group that a change to Kentucky's partial control of access law (KRS 177.240) became effective July 12, 2006. This change, enacted by the Legislature during the past session, removes the 15% limit on modifications to the 600 (urban)/1,200 (rural) minimum spacing requirement that can be allowed on highways with designated partial control of access. Any modification to the minimum spacing requirement would still require an "engineering and traffic study approved by the state highway engineer", but as of this meeting date the Cabinet had not reached any decisions on how requests for modified spacing will be handled or the type of traffic studies that might be required. It is also unclear whether the Cabinet will continue to design highway improvement projects with partial control of access. During the discussion that followed an opinion was expressed that the

reason for removal of the 15% limit probably had to do with the inflexibility of the partial control of access law and the difficulties, particularly in mountainous terrain, created by the absolute spacing requirements. It was noted that, in this respect, the proposed access management regulations are superior to the partial control law because of the flexibility that has been built into the proposed regulations.

The fact that there are no guidelines for the traffic engineering studies that would be needed to justify reduced spacing on partial control of access highways was a major concern to the task force. Brent Sweger suggested that the traffic impact study (TIS) requirements that were developed as a part of the proposed access management variance process could be used for this purpose. Adam Kirk briefly explained how the TIS requirements were developed and how they were intended to be applied in relation to the access management program. Chuck asked Duane Thomas and Tom Napier to take the lead on defining a process for incorporating the proposed TIS requirements (or some modified version of those requirements) into access permit application and review procedures for partial control highways.

5. Adam Kirk reported that the research and methodology development for quantifying the benefits of Kentucky's proposed access management program had been completed and that the draft report was ready for review. Adam explained that the methodology utilized a group of sample sections from each of the eight access management classifications, data collected from aerial photographs on the current access spacing on those sections, crash data for the sample sections, and the use of NCHRP 420 Access Impact Calculator techniques to estimate the safety and operational impacts of improved access spacing. Adam advised that the report would be emailed to task force members for review and comment before finalization.
6. Brent Sweger and Barry House discussed a planned effort to develop a median policy for the Cabinet. The objectives of this policy would be to: (1) guide highway designers on the use of medians, the choice of median type, and the location/type of median openings; and (2) provide guidance and standards for the consideration of permit requests at locations that involve medians (existing or installed as a permit condition). The desire for such a policy was expressed recently by the State Highway Engineer. An outline for the policy had been developed (provided below); however, given the more recent direction from the Highway Commissioner, it was decided that this effort should be put on hold.
 - Introduction - Importance of access management, evolution of Cabinet's standards, etc.
 - Median Type Guidelines
 - Median Opening Standards
 - Determination of applicable Access Management Standards – Brief how-to discussion based on access management classification of route
 - Use of Median Type Guidelines and Median Opening Standards for highway design
 - Application (when are guidelines and standards applicable)
 - Decision making process
 - Variances from standards

- Documentation of decisions
- Application of Median Standards for access permitting
 - Application (when are guidelines and standards applicable)
 - Partial Control vs. By Permit roadways
 - Decision making process
 - Design considerations (left-turn storage)
 - Variances from standards
 - Documentation of decisions
- Appendix A – Classification System
 - Rationale
 - Definitions
 - Where to locate
 - Procedures for requesting change (if deemed misclassified)
- Appendix B – Variances from Standards
 - Reasons for which variances may be appropriate
 - Major vs. Minor variances and justification required for each
 - Variance decision making process
 - Documentation of variance decisions

13. Appendix B

Access Management Classification Algorithm

Purpose: To determine an “Access Management Classification” code for each state maintained highway section based on the following data items: Functional Classification, Average Daily Traffic Volume, and Speed Limit. The procedure will also identify “short sections” where system continuity may be an issue, and it will resolve the Access Management Classification for short sections that make up a logical section of adequate length. Those short sections that are not resolved will be flagged for manual inspection.

Step 1 – Based on Functional Classification

FC – Functional Classification; AMC – Access Management Classification

If FC=2, AMC=R1
If FC=6, AMC=R2
If FC=7, AMC=R3
If FC=8, AMC=R3
If FC=9, AMC=R4
If FC=12, AMC=U1
If FC=14, AMC=U1
If FC=16, AMC=U2
If FC=17, AMC=U3
If FC=19, AMC=U4

Sum the statewide mileage for each AMC.

Step 2 – Revise Based on Traffic Volume and Speed Limit

ADT – Average Daily Traffic Volume; SL – Speed Limit

For AMC=R1 (from Step 1) – If $ADT < 5000$ and $SL < 45$, AMC=R2 (change AMC from R1 to R2)
For AMC=R2 – If $ADT \geq 5000$ and $SL \geq 45$, AMC=R1
For AMC=R2 – If $ADT < 2500$ and $SL < 45$, AMC=R3
For AMC=R3 – If $ADT \geq 2500$ and $SL \geq 45$, AMC=R2
For AMC=U1 – If $ADT < 10000$ and $SL < 45$, AMC=U2
For AMC=U2 – If $ADT \geq 10000$ and $SL \geq 45$, AMC=U1
For AMC=U2 – If $ADT < 5000$ and $SL < 45$, AMC=U3
For AMC=U3 – If $ADT \geq 5000$ and $SL \geq 45$, AMC=U2

Sum the statewide mileage that changes AMC for each of the 8 cases above (mileage downgraded from R1 to R2, mileage upgraded from R2 to R1, mileage downgraded from R2 to R3, mileage upgraded from R3 to R2, etc.).

Step 3 – Refine Short Sections for System Continuity

L – Section Length; SCF – System Continuity Flag

If FC=2 and $L < 1.0$, SCF=1

If FC=6 and $L < 1.0$, SCF=1

If FC=7 and $L < 1.0$, SCF=1

If FC=8 and $L < 1.0$, SCF=1

If FC=9 and $L < 1.0$, SCF=1

If FC=12 and $L < 0.5$, SCF=1

If FC=14 and $L < 0.5$, SCF=1

If FC=16 and $L < 0.5$, SCF=1

If FC=17 and $L < 0.5$, SCF=1

If FC=19 and $L < 0.5$, SCF=1

Step 3, Condition 1 – AMC of short section same as sections on either side

Short – Short section (SCF=1)

Before – Adjacent section on same route with End Milepoint same as Short Begin Milepoint

After – Adjacent section on same route with Begin Milepoint same as Short End Milepoint

CL – Combined length of Short, Before, and After sections

Note1: Route sections sorted by County, Route Number, Begin Milepoint.

Note2: If the Short section is the first section of the route, there will not be a Before section; in this case CL will be based on the Short and After sections only. If the Short section is the last section of a route, there will not be an After section; in this case CL will be based on the Short and Before sections only.

For SCF=1 compare AMC of Short to AMC of Before and After. If all 3 AMCs are same, calculate CL.

If AMC=R (R1, R2, R3, or R4) and $CL \geq 1.0$, change SCF to 0

If AMC=U and $CL \geq 0.5$, change SCF to 0

Otherwise SCF is not changed.

14. Appendix C

Access Management Classification Manual Review

The Kentucky Transportation Cabinet memorandum that is copied on the next two pages is a directive from the Commissioner of Highways that each Highway District Office establish a working team to conduct a manual review of the preliminary (data determined) access management classification system.

The two pages that follow, with the heading “Access Management Classification System Review”, are the instructions/guidelines that were provided to review team members during training sessions held in each District Office.



TRANSPORTATION CABINET

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Ernie Fletcher
Governor

Bill Nighbert
~~Acting Secretary~~

Marc Williams
Commissioner of Highways

MEMORANDUM

TO: Chief District Engineers

FROM: Marc D. Williams, P.E.
Commissioner of Highways 

DATE: December 9, 2005

SUBJECT: Implementation of Access Management Program
Access Management Classification System

As you may know, implementation of an access management program in Kentucky is a goal contained in the Joint KYTC/FHWA Strategic Plan ("Paths to Progress"). Efforts to do this were initiated in 2002 by means of a Kentucky Transportation Center research study titled "Access Management for Kentucky". Following publication of the research report in February 2004, an Access Management Implementation Task Force was formed by the Cabinet to pursue implementation of the research recommendations.

The components of an access management system can be summarized in the following steps:

1. Classification of roadways to reflect the importance and intended function of each roadway, with particular attention given to the relative priority that should be given to traffic flow versus land access;
2. Definition of allowable levels of access for each road class, including criteria for the spacing of access points and appropriate geometric design criteria; and
3. Adoption of appropriate regulations and administrative procedures, including a procedure for considering variances from the adopted standards.

Significant progress has been made on the first two steps, and an outline for a variance process has been developed. We are now at a point where District review and input is needed to finalize the access management classification system. Classification system parameters have been defined, and initial assignments of routes to system classes has been completed (computer determined based on available data). These initial assignments need to be reviewed and refined, as necessary, based on considerations for which data is not readily available, such as adjoining land use, and for system continuity.

It is requested that each District identify an Access Management Classification Review Team for this task. It is suggested that the team be made up of persons from the planning, permits, and traffic operations functions. This team will review maps and data

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lists and apply other considerations based on first-hand familiarity with the routes and their environment (field reviews should not be necessary). It is anticipated that two - four hours of team review per county should be adequate for most cases. A training session (approximately two hours) for team members will be provided before the review commences, and guidelines will be included. Please have your team leader contact Barry House (email would work best) as soon as possible to schedule a training session for your District. If you have questions or need additional information, please contact Barry House or Brent Sweger.

MDW:CAK:BCH

c: Brent Sweger
Nancy Albright
Duane Thomas
Daryl Greer

Access Management Classification System Review

Background

An Access Management Classification System is being established for the purpose of associating access spacing and design standards to state-maintained highways in Kentucky based on the intended function (with respect to traffic mobility vs. property access) of the roadway. Initial Access Management Classification assignments have been made based on the functional classification, traffic volume, and posted speed limit of each route segment. These classification assignments have been plotted on maps, and supporting data tables have been prepared to provide more information and detail. The District Offices are being asked to review and refine the initial classification assignments. Such refinement is desirable to identify cases where considerations other than functional classification, traffic volume, and posted speed data (such as surrounding land use or roadway geometry) suggest that a higher or lower classification would be more appropriate for access management purposes. Refinement may also be needed for certain route segments from a system continuity standpoint.

General Guidelines

1. Except for rare instances, classification upgrades or downgrades should be limited to one class higher or lower.
2. The fact that current access spacing along a particular roadway may not conform to the access spacing standard for the assigned class is not justification, by itself, for downgrading the classification. Always remember that the classifications should reflect the purpose and importance of the roadway. Roads that are intended to carry high volumes of traffic at moderate to high speeds should not be assigned a low classification simply because existing access points are spaced closely together.
3. Route segments near the boundary of urban areas (where the functional classification changes from rural to urban) should be closely examined. Abrupt, significant changes in access standards are undesirable.
4. Route segments near county lines should be examined for system continuity from county to county.
5. Access standards should not change frequently or illogically over short distances. Because the database used for the initial classification assignments contained many short segments, it may be necessary to make certain adjustments along a route to achieve adequate system continuity.

Examples of Factors to Consider and Potential Adjustments

1. While the initial classification assignments have been based on current data, the classification of a roadway should reflect the long-term function (mobility vs. access) that the road is planned to serve. A higher classification assignment may be needed to protect the mobility function of a highway in cases where the traffic volume is expected to increase substantially in the future. Conversely, a lower classification may be appropriate in cases where the function or importance of a road/street is expected to substantially diminish in the future.
2. Facilities where the current level of access control is Partial Control of Access should have a Class I designation. Similarly, roads scheduled for major reconstruction or widening could warrant a higher classification assignment in order to preserve the mobility benefits of the improvement investment.
3. Routes that have a higher function from a local perspective than that assigned at the state level or that have a local strategic importance (such as routes that provide access to a hospital, school, or other major traffic generator or routes that serve as a gateway to a city) could warrant a higher class assignment.
4. Opportunities for more effective access management (than that based on the initially assigned class) along an undeveloped urban route that is likely to develop in the future could warrant a higher classification assignment.
5. A route through an urban/suburban area that is planned for substantial development or redevelopment could warrant a higher classification assignment in order to encourage “smart growth” (this may include combined driveways, inter-parcel connections, reverse frontage roads, etc.).
6. Presence of a nontraversable median offers increased opportunities for access management strategies and could warrant a higher classification assignment.
7. A multi-lane facility with moderate to high travel speeds is indicative of a priority for traffic flow (over access) and a higher classification assignment could be warranted.
8. Existing intersection spacing and access needs along a principal arterial in a downtown area would likely be inconsistent with Urban I criteria, and a lower classification assignment may be warranted.
9. Existing access needs within densely developed commercial areas, where access has a priority over traffic flow, could warrant a lower classification assignment.
10. A roadway section with a rural functional classification but with urban-like characteristics, such as "Main Street" through a small city (not large enough for urban area designation), could warrant a change from a rural to an urban category.
11. A roadway section with an urban functional classification but with rural-like characteristics, such as undeveloped suburban fringe areas where development is unlikely, could warrant a change from an urban to a rural category.

15. Appendix D

Rationale for Median Type Recommendations

The purpose of this technical white paper is to provide a summary of the proposed median type standards for incorporation in the Kentucky Highway Access Management Plan. The proposed standards are based on independent engineering analysis and previous research conducted on median type applications. The results of these studies are presented below.

This standard addresses median types for 2-lane and multi-lane roadways having unsignalized, at-grade intersections. The four primary median treatments considered for inclusion in this standard are:

- Undivided roadway
- Undivided roadway with Left-Turn Lanes
- Flush Median
- Nontraversable Median

Each median type identified above has been shown to have desirable operational, safety or economic benefits. The following sections identify the optimum roadway, traffic volume and access characteristics for each median type. It should be noted that traversable raised medians are not dealt with in this paper (and are not recommended) because they neither facilitate left turns nor do they provide positive control over left-turn movements.

Undivided Roadway - Undivided roadways provide an economical solution, where right of way is limited and there is a limited number of low volume access points to the primary roadway. Undivided roadways should only be considered when left turning vehicles do not interfere with advancing or opposing traffic due to infrequency and low volume of the left turn movement and low volume of advancing and opposing traffic.

Undivided Roadway with Left-Turn Lanes - When the volume of turning and through traffic exceeds minimal levels, resulting in increasing delay for through and turning traffic, the construction of an exclusive auxiliary left-turn lane should be considered to remove left turning traffic from the advancing traffic stream. Warrants should be adopted, based on operational and queuing analysis, identifying minimum volume thresholds that would warrant a left-turn lane.

Left-turn lanes should be constructed with adequate length to provide for storage of queued turning vehicles and deceleration on high speed roadways.

Guidelines should be developed or adopted that address proper storage and deceleration length requirements for left-turn lanes.

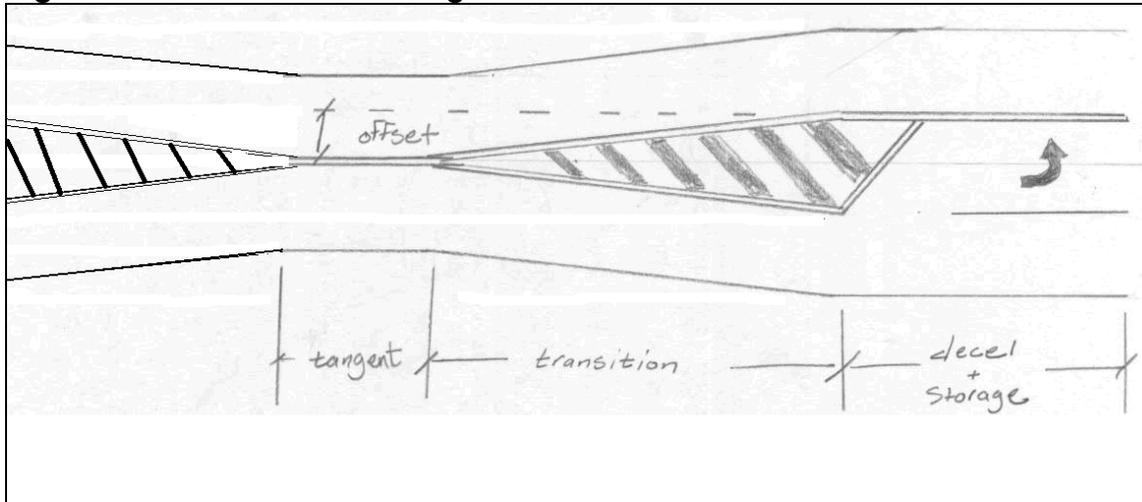
In addition, proper transitions should be used when widening an undivided roadway to provide for a median left-turn lane. Transition lengths can be determined using the Equations 1 and 2, given below (1). A minimum tangent length of 100 feet is recommended between transitions.

EQ 1. $L = WS$ (For Speeds greater than or equal to 45 mph)
 EQ 2 $L = WS^2/60$ (For Speeds less than 45 mph)

Where: L= Length of Transition (ft)
 W= Width of Offset (ft)
 S= 85th Percentile or Statutory Speed Limit (mph)

Figure 1 shows the various components of the left turn lane design.

Figure 1: Left Turn Lane Design



Flush Median - In order to provide a consistent cross section, a flush median is recommended for roadways with access point densities greater than 10 access points per mile. This density represents the approximate access spacing at which it is impossible to provide proper transitions and tangent lengths as identified in Figure 1 above. At this density a center flush median lane should be considered which can be striped as individual left turn lanes or a Two-Way Left-Turn Lane (TWLTL).

The flush median should be demarcated to provide exclusive left turn lanes when possible. Left turn lanes within a flush median should provide the same storage and deceleration lengths as described above. Transitions and tangent need not be provided between left turn lanes and back to back left turn lanes may be provided. Flush median space not designated as a left turn lane should be demarcated by double yellow lines adjacent to each traffic lane with optional transverse lines in the median.

When access densities increase to the point that it is impossible to provide exclusive left turn lanes with adequate deceleration and storage length, without interfering with adjacent access points, a TWLTL should be considered.

TWLTLs have been shown to provide improvements in safety and operations at moderate traffic volumes with moderate to high access point densities. The primary concern with TWLTLs is the potential for head-on conflicts between turning traffic and queuing conflicts across access points.

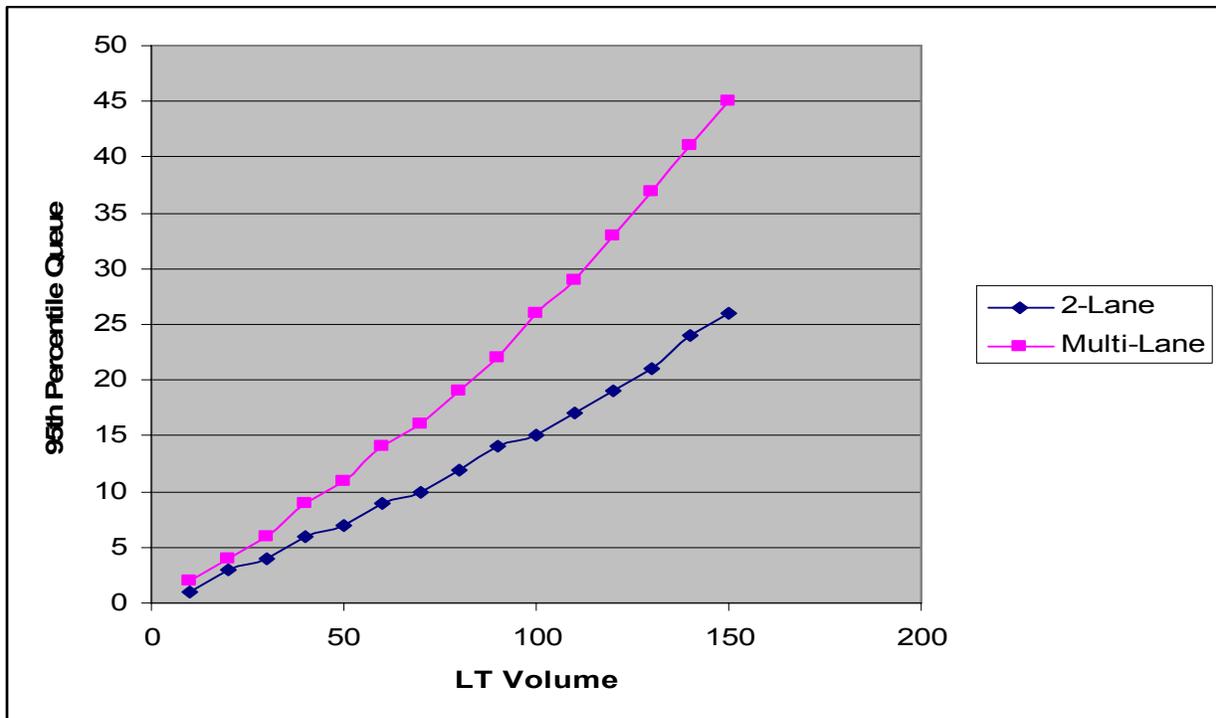
The following volume and access density thresholds are proposed to ensure the proper operation and safety of TWLTLs.

TWLTLs are not recommended on three lane roadways having an ADT greater than 17,000 and multi-lane roadways having an ADT greater than 24,000 (2,3). At higher ADTs the availability of adequate gaps to clear left turning traffic become less frequent, increasing the delay and queuing of left turning traffic and increasing the potential for queuing conflicts and traffic interfering with the through movement.

Additionally, TWLTLs are not recommended on roadways having an access point density greater than 85 access points per mile. This density is based on an average access point spacing of 125 feet, which provides adequate separation of ingress and egress turning movements based on field studies of vehicular turning and lane change behaviors (4,5). Higher access densities have the potential to significantly increase the likelihood of conflicts between turning traffic.

TWLTLs are also not recommended at access points serving left turning ingress volumes greater than 100 vph for multi-lane roadways and 150 vph for three lane roadways. These volume thresholds are based on operational and queuing analysis, and represent the volume at which the 95th percentile queue exceeds 1 vehicle (25 ft). This analysis was conducted assuming maximum opposing volume given by the recommended maximum ADT thresholds noted above, and applying K and D factors of 0.10 and 0.6, respectively. Figure 2 illustrates the queuing analysis for two-lane and multi-lane roadways.

Figure 2: Queuing Analysis



Nontraversable Median - A nontraversable median is recommended on all existing roadways in which the ADT, access density and/or turning volumes exceed the maximum thresholds established above for a TWLTL. When the TWLTL thresholds are exceeded the conversion of the access points to Right-In Right-Out (RIRO) movements, has the ability to remove conflict points from turning traffic and improve corridor operations by eliminating left mid-block turning movements.

Nontraversable medians are also recommended for the following general conditions (3,6):

- All new multilane arterials
- Existing rural multilane arterials
- Crossroads in the vicinity of interchanges
- Multilane roadways with high pedestrian activity

Summary of Median Type Guidelines

Individual left-turn lanes recommended for:

- Locations where left-turn volume exceeds warrant (to be determined), and
- Access point density ≤ 10 ap/mi (access points per mile)

TWLTL generally appropriate for:

- Urban/suburban 3-lane roadways with:
 - projected ADT < 17,000
 - access point density > 10 ap/mi and < 85 ap/mi
 - left-turn volume < 150 vph
- Urban/suburban multi-lane roadways with:
 - projected ADT < 24,000
 - access point density > 10 ap/mi and < 85 ap/mi
 - left-turn volume < 100 vph

Nontraversable medians recommended for:

- All new multilane arterials
- Existing roadways where ADT, access density, and/or turning volumes exceed thresholds established above for TWLTLs
- Existing rural multilane arterials
- Crossroads in the vicinity of interchanges
- Multilane roadways with high pedestrian activity

Note: Traversable raised medians are not recommended since they neither facilitate left turns nor do they provide positive control over left turn movements.

Appendix D References

1. "Manual on Uniform Traffic Control Devices". Federal Highway Administration. Washington, D.C., 2003.
2. "NCHRP Report 420: Impacts of Access Management Techniques." Transportation Research Board, Washington, D.C., 1999
3. "Access Management Manual" Transportation Research Board. Washington D.C., 2003.
4. "Brevard Transportation Plan." Wilbur Smith and Associates. Cocoa FL., 2002.
5. "NYS Route 31 Transportation Study." Hamlet of Egypt, NY. 2001.
6. "NCHRP Synthesis 332: Access Management on Crossroads in the Vicinity of Interchanges" Transportation Research Board, Washington, D.C., 2004.

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