F236-09/10, Part I
Appendix K (New)

NOTE: PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART II IS REPRODUCED ONLY FOR INFORMATIONAL PURPOSES FOLLOWING ALL OF PART I.

Proposed Change as Submitted

Proponent: Sean DeCrane, Cleveland Fire Department, representing International Association of Fire Fighters

PART I – IFC

Add new appendix as follows:

APPENDIX K
BUILDING INFORMATION SIGN

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K 101
GENERAL

K101.1 Scope New buildings shall have a building information sign(s) that shall comply with Sections 505.3.1 through 505.3.7. Existing buildings shall be brought into conformance with Sections K101.1 through K101.9 when one of the following occurs:

1. The fire department conducts an annual inspection intended to verify compliance with this section of the code, or any required inspection.
2. When a Change in Use or Occupancy has occurred.

Exceptions:

1. Utility occupancies
2. One and Two-family dwellings

K101.1.1 Sign location. The building information sign shall be placed on one of the following:

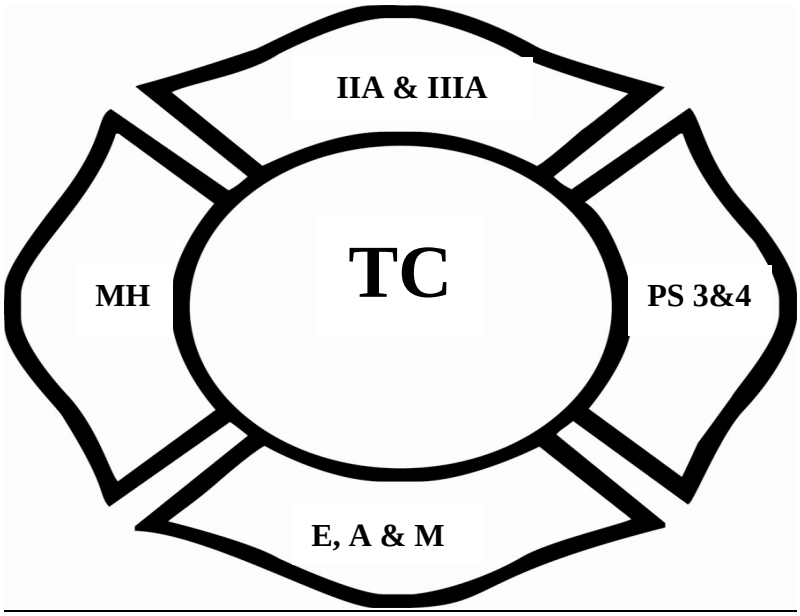
1. The entry door or sidelight at a minimum height of 42" above the walking surface on the address side of the building or structure;
2. The exterior surface of the building or structure no further than 3' from the entrance door, on either side of the entry door, at a minimum height of 42" above the walking surface on the address side of the building or structure;
3. Conspicuously placed, inside an enclosed entrance lobby, on any vertical surface within 10 feet of the entrance door at a minimum height of 42" above the walking surface;
4. Located inside the building's fire command center;
5. Located on the exterior of the fire alarm panel or immediately along side the panel door on the wall if the alarm panel is located in the enclosed main lobby.

K101.1.2 Sign features. The building information sign shall consist of:

1. White reflective background with red letters;
2. Durable material;
3. Numerals shall be Roman or Latin numerals, as required, and/or alphabet letters;
4. Permanently affixed to the building or structure in an approved manner.

K101.1.3 Sign shape. The building information sign shall be a Maltese Cross as shown in Figure K101.1.3

Top Wing



Bottom Wing

FIGURE K101.1.3
BUILDING INFORMATION SIGN

K101.1.4 Sign size and lettering. The minimum size of the building information sign and lettering shall be in accordance with the following:

1. The width and height shall be 6 inches by 6 inches
2. The height or width of each Maltese cross wing area shall be 1 1/8 inches and have a stroke width of ½ inch;
3. The center of the Maltese cross a circle of oval 3 ⅛ inches in diameter and has a stroke width of ½ inch;
4. All roman numerals and alphabetic designations, shall be 1 ¼ inch height and have a stroke width of ¼ inch.

K101.2 Sign designations. Designations shall be made based upon the construction type, content, hazard, fire protection systems, life safety and occupancy. Where multiple designations occur within a classification Category, the designation used shall be based on the greatest potential risk.

K101.3 Construction type (TOP WING). The construction types shall be designated by assigning the appropriate Roman numeral, and letter, placed inside the top wing of the Maltese cross. The hourly rating provided is for the structural framing in accordance with Table 601 of the *International Building Code*,

Construction Type	**Hourly Rating**
IA - Non-Combustible Construction -	3 Hour Rating
IB –Non-Combustible Construction -	2 Hour Rating
IIA – Non-Combustible Construction -	1 Hour Rating
IIB – Non-Combustible Construction -	0 Hour Rating
IIIA – Non-Combustible/Combustible Construction -	1 Hour Rating
IIIB – Non-Combustible/Combustible Construction -	0 Hour Rating
IV – Heavy Timber Construction -	
VA – Combustible Construction -	1 Hour Rating
VB – Combustible Construction –	0 Hour Rating

K101.4 Fire protection systems (Right Wing). The fire protection systems shall be designated by determining its level of protection and assigning the appropriate designation to the right wing of the Maltese cross. Where multiple systems are provided, all shall be listed:

AS – Automated Fire Sprinkler System installed throughout;
DS – Dry Sprinkler System and designated areas

FAS – Fire Alarm System
FP – Fire Pump
FW – Fire Wall and designated areas
PAS – Pre-Action Sprinkler System and designated floor
PS – Partial Automatic Fire Sprinkler System, and designate floor;
CES – Chemical Extinguishing System and designated area,
CS – Combination Sprinkler and Standpipe System;
S – Standpipe System;
NS – No system installed

K101.5 Occupancy type (Bottom Wing). The occupancy of a building or structure shall be designated in accordance with the occupancy classification found in Section 302.1 of the *International Building Code* and the corresponding designation shall be placed in the bottom wing of the Maltese cross. When a building or structure contains a mixture of uses and occupancies; all uses and occupancies shall be identified.

A – Assembly
B – Business
E – Educational
F – Factory or Industrial
H – High Hazard
I – Institutional
M – Mercantile
R – Residential
S – Storage

K101.6 Hazards of content (Left Wing). The hazards of building contents shall be designated by one of the following classifications as defined in NFPA 13 and the appropriate designation shall be placed inside the left wing of the Maltese cross:

LH - Light Hazard
MH - Moderate Hazard
HH - High Hazard

K101.7 Tactical Considerations (Center Circle). The Center Circle shall include the name of the local Fire Service and when required the letters TC for Tactical Considerations. When fire fighters conduct pre-plan operations, a unique situation(s) for tactical considerations shall be identified and the information provided to the fire dispatch communications center to further assist fire fighters in identifying that there is special consideration(s) for this occupancy. Special consideration designations include, but are not limited to:

1. Impact resistant drywall
2. Impact resistant glazing, such as blast or hurricane type glass
3. All types of roof and floor structural members including but not limited to post tension concrete, bar joists, solid wood joists, rafters, trusses, cold-formed galvanized steel, I-joists and I-beams; Green roof with vegetation, soil & plants
4. Hazardous materials, explosives, chemicals, plastics, etc;
5. Solar Panels and DC electrical energy
6. HVAC system; and smoke management system for pressurization and exhaust methods
7. Other unique characteristic(s) within the building that are ranked according to a potential risk to occupants and firefighters

K101.8 Sign classification maintenance, Building information sign maintenance shall comply with each of the following:

1. Fire departments in the jurisdiction shall define the designations to be placed within the sign.
2. Fire departments in the jurisdiction shall conduct annual inspections to verify compliance with this section of the code and shall notify the owner, or the owners agent, of any required updates to the sign in accordance with fire department designations and the owner, or the owner's agent, shall comply within thirty (30) days.
3. The owner of a building shall be responsible for the maintenance and updates to the sign in accordance to fire department designations.
4. The owner of a building shall notify the fire department of any changes that possibly effect the classifications, of the system, within thirty (30) days of the changes and the Fire Department shall conduct an inspection.

5. The owner of a building shall change the effected classification posted on the sign within thirty (30) days of the changes.

K101.9 Training. Jurisdictions shall train all fire department personnel on Sections K101.1 through K101.9

Reason: This Building Information Sign (BIS) is designed to be utilized in the crucial initial response of fire fighters to a structure fire. Similar to the Emergency Response Guidebook, published by the Department of Transportation, the BIS placard is designed to be utilized within the initial response time frame of an incident. Firefighters are trained to size-up a situation as early as possible after notification. The outward appearances of a building can be deceiving and the type of construction may not appear to be what it really is. This is becoming a more frequent occurrence within many communities.. Having the BIS placard will allow responding fire companies to make an informed tactical decision. The responding fire company will be able to identify the type of construction, hazard level of the contents, structural framework, occupancy of the building and the building fire protection system features , as well as he extent of the protection,

In the fire service there are many times we are dispatched to a location or area without an address, I.e. A fire company is dispatched in the vicinity of: Main St. and 5th Ave.. placing this information electronically will not address those incidents. Once the fire company has located the building or structure, the company officer can relay the correct address to the Dispatching Center and exit the apparatus to begin an assessment by making tactical decisions from the BIS building placard. The company officer cannot afford to wait until Dispatch sends an electronic form of the placard to t a mobile computer unit. This sign will give the arriving fire officer information to rapidly begin his/her assessment.

Another instance where a BIS placard is valuable for a Mutual Aid response to your community. Mutual Aid fire companies do not always share the same Dispatching Centers therefore they would not have the ability to receive the electronic communication. Placing this placard in designated locations will allow arriving Mutual Aid companies to begin proper tactical assessments.

Also within the Tactical Considerations (TC) section, the BIS placard will allow fire fighters to identify additional considerations. Just by seeing that there are additional TC considerations would give firefighters pause to consider unique aspects of the situation, such as:

Are there special needs for the occupants?
Is the interior constructed of impact resistant dry wall which will make wall breeching very difficult?
Is there hurricane glazing?
Is there an above ground 1500 gallons fuel oil tank in the basement?

Does the building contain dimension lumber, trusses, I-joists, cold formed steel, etc. in the roof or floors members?

These TC concerns can be identified and placed within the Tactical Considerations section of the BIS placard. The National Institute for Occupational Safety and Health (NIOSH) released an Alert Report, 'Preventing Injuries and Deaths of Fire Fighters Due to Truss System Failures[1] and made recommendations to identifying structures by suggesting that building owners and managers "Consider placing building construction information outside the building. Include information about roof and floor type (presence of trusses, materials used), roof loads (heating, ventilation, and air conditioning (HVAC) units, sprinkler systems, utilities, hazardous materials stored on site and emergency contact numbers. Use and follow the proper building codes."

This Building Information Sign has brought many people together from various private industries and public agencies such as:

Structural Building Component,
Steel & Wood industries,
Building officials, and the
Fire Service,

So as to collaborate on a BIS system that is comprehensive and meets the need of the fire service for information that allows for a quicker building assessment on the fire ground. This addresses a key question that has been asked for quite some time -- "How do we provide building information to the fire service?". With this Building Information Sign we will be providing fire fighters crucial information at the most important time period. Fire Officers will be able to make decisions-based tactics on the knowledge provided within this building BIS placard or be prompted by other Tactical Considerations to request more information from the dispatch center.

Bibliography:

1. NIOSH Alert – "Preventing Injuries and Deaths of Fire Fighters Due to Truss System Failures" April 2005

Cost Impact: The code change proposal will have a minimal increase to the cost of construction.

ICCFILENAME: DECRANE-F3-APPENDIX K.DOC

Public Hearing Results

PART I- IFC

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's reason statement and felt that this would be a useful appendix tool for the fire department. The committee also pointed out that sections dealing with symbol size and lettering size need to be correlated because, as written, the lettering side would be larger than the symbol wing space into which it must be placed.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, PE, International Code Consultants, representing National Multi Housing Council, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

K101.8 Sign classification maintenance. Building information sign maintenance shall comply with each of the following:

1. Fire departments in the jurisdiction shall define the designations to be placed within the sign.
2. Fire departments in the jurisdiction shall conduct annual inspections to verify compliance with this section of the code and shall notify the owner, or the owner's agent, of any required updates to the sign in accordance with fire department designations and the owner, or the owner's agent, shall comply within thirty (30) days.
3. The owner of a building shall be responsible for the maintenance and updates to the sign in accordance to fire department designations.
4. ~~The owner of a building shall notify the fire department of any changes that possibly effect the classifications, of the system, within thirty (30) days of the changes and the Fire Department shall conduct an inspection.~~
5. ~~The owner of a building shall change the effected classification posted on the sign within thirty (30) days of the changes.~~

(Portions of proposal not shown remain unchanged.)

Commenter's Reason: It is inappropriate for Appendix K to place a burden (and legal liability) on the owner to identify changes that might "possibly" effect the classifications assigned by Appendix K. Building owners are not typically knowledgeable about building construction, firefighting tactics or other topics contemplated by the warning sign, and they may not even occupy the building. If the fire department wants to use this system, it is incumbent upon them to do the required inspections and advise the owner what to post on the sign. The Annex provides for that without the need to include Items 4 and 5.

Final Action: AS AM AMPC____ D

NOTE: PART II REPRODUCED FOR INFORMATIONAL PURPOSES ONLY – SEE ABOVE

PART II – IBC GENERAL

Add new appendix as follows:

APPENDIX L
BUILDING INFORMATION SIGN
SECTION L101
GENERAL

L101.1 Scope New buildings shall have a building information sign(s) that shall comply with Sections 505.3.1 through 505.3.7. Existing buildings shall be brought into conformance with Sections L101.1 through L101.9 when one of the following occurs:

1. The fire department conducts an annual inspection intended to verify compliance with this section of the code, or any required inspection.
2. When a Change in Use or Occupancy has occurred.

Exceptions:

1. Utility occupancies
2. One and Two-family homes

L101.1.1 Sign location. The building information sign shall be placed on one of the following:

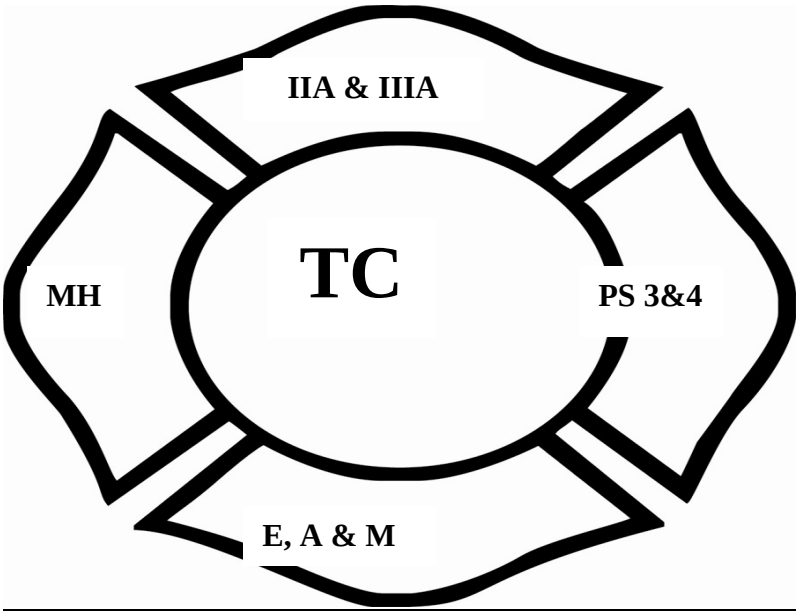
1. The entry door or sidelight at a minimum height of 42" above the walking surface on the address side of the building or structure;
2. The exterior surface of the building or structure no further than 3' from the entrance door, on either side of the entry door, at a minimum height of 42" above the walking surface on the address side of the building or structure;
3. Conspicuously placed, inside an enclosed entrance lobby, on any vertical surface within 10 feet of the entrance door at a minimum height of 42" above the walking surface;
4. Located inside the building's fire command center;
5. Located on the exterior of the fire alarm panel or immediately along side the panel door on the wall if the alarm panel is located in the enclosed main lobby.

L101.1.2 Sign features. The building information sign shall consist of:

1. White reflective background with red letters;
2. Durable material;
3. Numerals shall be Roman or Latin numerals, as required, and/or alphabet letters;
4. Permanently affixed to the building or structure in an approved manner.

L101.1.3 Sign shape. The building information sign shall be a Maltese Cross as shown in Figure L101.1.3

Top Wing



Bottom Wing

FIGURE L101.1.3
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This Building Information Sign has brought many people together from various private industries and public agencies such as:

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So as to collaborate on a BIS system that is comprehensive and meets the need of the fire service for information that allows for a quicker building assessment on the fire ground. This addresses a key question that has been asked for quite some time -- "How do we provide building information to the fire service?". With this Building Information Sign we will be providing fire fighters crucial information at the most important time period. Fire Officers will be able to make decisions-based tactics on the knowledge provided within this building BIS placard or be prompted by other Tactical Considerations to request more information from the dispatch center.

Bibliography:

1. NIOSH Alert – "Preventing Injuries and Deaths of Fire Fighters Due to Truss System Failures" April 2005

Cost Impact: The code change proposal will have a minimal increase to the cost of construction.

PART II-IBC GENERAL
Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposed appendix should not be placed in the IBC because it is predominantly fire department specific in much of its content (i.e., pertaining to FD training, tactics, procedures, etc.).

Assembly Action: **None**

F237-09/10
Appendix K (New)

Proposed Change as Submitted

Proponents: Patrick Siegman, Principal, Nelson, Nygaard Consulting Associates, representing the Congress for the New Urbanism; Peter Swift, Owner, Swift and Associates, representing the Congress for the New Urbanism; John Norquist, CEO, Congress for the New Urbanism

Add new Appendix as follows:

APPENDIX K
STREET DESIGN FOR LIFE SAFETY

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K101
GENERAL

K101.1 Intent. The purpose of this appendix is allow jurisdictions to adopt performance-based requirements for fire apparatus access roads, in order to achieve all of the following purposes:

1. Establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations.
2. On the new and existing fire apparatus access roads required by and regulated by this code, establish requirements consistent with nationally and internationally recognized good practice for achieving a reasonable level of overall life safety, by taking into account and balancing the need to prevent road traffic deaths and injuries and the need to safeguard against the hazards of fire, explosions and other dangerous conditions.

K101.2 Scope. If this appendix is adopted by a jurisdiction, then the following changes to the current provisions of the code come into effect within the jurisdiction:

101.2 Scope. This code establishes regulations affecting or relating to structures, processes, premises and safeguards regarding:

1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices;
2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises;
3. Conditions hazardous to life, property or public welfare on or relating to the design of fire apparatus access roads, including the hazards of traffic, fire, explosion and other dangerous conditions;
~~3.~~ 4. Fire hazards in the structure or on the premises from occupancy or operation;
~~4.~~ 5. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems.
~~5.~~ 6. Conditions affecting the safety of fire fighters and emergency responders during emergency operations.

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations. Additionally, on the new and existing fire apparatus access roads required by and regulated by this code, the purpose of this code is to establish requirements consistent with nationally and internationally recognized good practice for achieving a

reasonable level of overall life safety, by taking into account and balancing the need to prevent road traffic deaths and injuries and the need to safeguard against the hazards of fire, explosions and other dangerous conditions.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width ~~of not less than 20 feet (6096 mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6,~~ and an unobstructed vertical clearance ~~of not less than 13 feet 6 inches (4115 mm).~~ that permits passage of the jurisdiction's fire apparatus and, wherever necessary, provides adequate space for deploying the jurisdiction's fire apparatus and for conducting fire and rescue operations.

~~**503.2.2 Authority.** The fire code official shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations.~~

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall ~~be determined by the fire code official.~~ provide for the passage of the jurisdiction's fire apparatus.

503.2.7 Grade. The grade of the fire apparatus access road shall be ~~within the limits established by the fire code official based on the fire department's apparatus.~~ limited to grades that permit passage by, and, wherever necessary, fire and rescue operations by, the jurisdiction's fire apparatus.

503.2.8 Design for road traffic safety. Fire apparatus access roads shall be designed and maintained so as to minimize road traffic deaths and injuries, while maintaining adequate provision for the passage of fire apparatus and for fire and rescue operations. To achieve these goals, fire apparatus access roads shall be designed and maintained to both: (a) permit passage of the jurisdiction's fire apparatus and, wherever necessary, provide adequate space for deploying the jurisdiction's fire apparatus and conducting fire and rescue operations; and (b) minimize excess and inappropriate vehicle speeds.

Reason: This proposed code change provides an appendix that allows, but does not require, a jurisdiction to substitute revised material for current provisions of the code. That is, if the appendix is adopted by a jurisdiction, then the jurisdiction has elected to substitute revised materials for current provisions of the code. This appendix is intended to allow jurisdictions to take an approach to the design of fire apparatus access roads that improves overall life safety, by allowing jurisdictions to adopt roadway designs that strike the best possible balance between reducing the hazards of fire and reducing road traffic deaths and injuries, given the jurisdiction's own particular circumstances and particular choice of fire apparatus.

The text below attempts to provide clear and succinct answers to the questions asked for in the "Supporting Information" Section of the Code Change Proposal Instructions. That is, the following paragraphs state the purpose of the proposed code change, justify changing the current code provisions and seek to explain why the proposed code change is superior to the current provisions of the code.

1. What is the purpose of this proposed code change (e.g., clarify the code; revise outdated material; substitute new or revised material for current provision of the code; add new requirements to the code; delete current requirements, etc.)?

Response: This proposed code change provides an appendix that allows, but does not require, a jurisdiction to substitute revised material for current provisions of the code. That is, if the appendix is adopted by a jurisdiction, then the jurisdiction has elected to substitute revised materials for current provisions of the code. This approach will allow jurisdictions to take an approach to the design of fire apparatus access roads that we believe improves overall life safety, by allowing jurisdictions to adopt roadway designs that strike the best possible balance between reducing the hazards of fire and reducing road traffic deaths and injuries, given the jurisdiction's own particular circumstances and particular choice of fire apparatus. By allowing, but not requiring, jurisdictions to adopt this proposed appendix, the ICC will make it possible for jurisdictions to demonstrate the efficacy of this approach, without taking the more far-reaching step of simply altering the basic code.

2. What is the justification for changing the current code provisions? Why is the proposal superior to the current provisions of the code? Proposals that add or delete requirements shall be supported by a logical explanation which clearly shows why the current code provisions are inadequate or overly restrictive, specifies the shortcomings of the current code provisions and explains how such proposals will improve the code.

Response: The current International Fire Code specifies dimensions for fire apparatus access roads. Three key points about fire apparatus access roads should be noted:

1. The code requires that at least one fire apparatus access road be provided for every facility, building or a portion of the building hereafter constructed or moved into within a jurisdiction.
2. The code defines a fire apparatus access road as a road that provides fire apparatus access from a fire station to a facility, building or portion thereof.
3. The code defines fire apparatus access road as a general term inclusive of all other terms such as fire lane, public street, private street, parking lot lane and access roadway.

Therefore, since at least one fire apparatus access road must reach from a fire station to every building and facility constructed once the code is adopted, **the current International Fire Code specifies the key dimensions of many, if not most, public and private streets.** This is significant not only for fire safety, but also for road safety. A substantial body of traffic safety research literature has found conclusively that the dimensions of streets significantly affect road safety. Therefore, **the current International Fire Code sets specifications for the design of many, if not most, public and private streets, and these specifications significantly affect traffic safety.**

Since the essential purpose of the International Fire Code is to provide for a reasonable level of life safety and property protections from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations, the code may not always be thought of as a code that has significant and far-reaching effects on road safety. The reality, however, is that the International Fire Code does significantly affect road design, and therefore, significantly affects road traffic deaths and injuries.
We believe that the International Code Council can substantially advance the cause of improving overall life safety by taking the following actions:

1. ***Embrace the goal of improving overall life safety***, including preventing not only the tragedies caused by fire, structural collapse and other hazards that have long been explicitly focused on by code enforcement and fire officials, but also road traffic deaths and injuries.
2. ***Dedicate itself to reducing the burden of global road traffic deaths and injuries***, by committing itself to work in partnership with a broad range of organizations and governments to develop and implement road safety strategies, plans and codes.
3. ***Work together with road safety organizations to thoroughly review the existing codes promulgated by the International Code Council to ensure that the codes embrace internationally recognized good practices for protecting life safety, including not only reducing the hazards of fire, explosion and other dangerous conditions in buildings, but also reducing road safety hazards.***

While the International Code Council may never wish to expand its mission to include the task of writing full road safety codes, the Council can and we believe should work closely with road safety organizations to ensure that building codes and regulations, such as the fire apparatus access road provisions of the International Fire Code, allow for and encourage best practices in road safety.

The attached code change proposal is submitted in the spirit of cooperation between code enforcement and fire officials and road safety professionals. It was drafted out of our concern that the current provisions of the International Fire Code for fire apparatus access roads do not strike the best possible balance between reducing the hazards of fire and other building-related hazards, and reducing road traffic deaths and injuries. This submission is intended as a first step in bringing road safety professionals and fire service professionals together to work on an area of mutual concern: fire apparatus access roads are not only the areas where firefighters must set up equipment and fight conflagrations, but also the site of innumerable traffic deaths and injuries. The design of fire apparatus access roads (that is, the design of many public and private streets) is necessarily a balancing act, where there are frequently conflicts, tensions and trade-offs between the goals of improving road safety and improving fire safety. The very best design for bringing fire engines quickly to the scene of an incident, or the very best design for providing room to deploy equipment at the scene of a fire, is often not the best design for ensuring low motor vehicle speeds and pedestrian safety at a school crosswalk, or on a quiet residential street.

In drafting this code change proposal, we sought to recognize these tensions and trade-offs regarding fire apparatus access roads, and then to draft a code change proposal that would allow jurisdictions to do a better job of overcoming these conflicts. This code change proposal is intended to allow jurisdictions to design roads for overall life safety, including both fire safety and road safety. It is based on the following principles:

1. The necessary minimum dimensions of fire apparatus access roads are driven in large part by the size, weight, configuration and capabilities of a jurisdiction's fire apparatus.
2. The necessary minimum dimensions of fire apparatus access roads also depend on the staffing, strategies and tactics employed by a jurisdiction.
3. The characteristics of fire apparatus, and the staffing, strategies, and tactics of firefighters and emergency responders, vary widely from jurisdiction to jurisdiction, both internationally and within nations.
4. Roadway dimensions and design significantly affect road safety.
5. Therefore, the roadway designs that can be used by a jurisdiction to improve road safety on fire apparatus access roads vary depending on the fire apparatus employed by that community. Designs for road safety that work well in one jurisdiction may introduce significant difficulties for fire fighting in another jurisdiction where the fire apparatus that is in use is significantly larger, less maneuverable or less capable of deploying in a smaller space.
6. Therefore, rather than employing a one-size-fits-all approach to fire apparatus access roads, which assumes that all jurisdictions around the world and across the nation employ similar fire apparatus, this proposed code change recommends a performance-based approach.
7. Employing a more performance-based approach will make it possible to better balance the goals of improving road safety and improving fire and building safety, while taking into account the major differences between jurisdictions in fire apparatus, staffing, strategies and tactics.

We note that the existing provisions for fire apparatus access roads in Section 503 contain a mix of prescriptive and performance-based requirements. This proposed code change moves further in the direction of a performance-based approach, in the interest of making it more feasible to adopt roadway design solutions that resolve conflicts between road safety and fire safety, are carefully tailored to the fire apparatus in use in a jurisdiction, and improve overall life safety.
As background, the following sections briefly review several considerations that are crucial for designing streets that improve overall life safety. These sections briefly review:

the magnitude of road traffic deaths and injuries
road safety risk factors
the relationship between street design and road safety
examples of roadway design elements that improve road safety
the tensions and trade-offs between accommodating needed access for and operations of fire apparatus, and designing streets that improve road safety

First, what is the magnitude of the road traffic safety problem, and why should the ICC be concerned about it?

Why should the International Code Council be concerned about road safety?
The Commission for Global Road Safety succinctly describes the reasons why all citizens, and particularly those of us who dedicate their professional lives to improving public safety, should focus our attention on road safety. According to the Commission's 2006 report, *Make Roads Safe*[1]:

1 Commission for Global Road Safety. *Make Roads Safe*. London, United Kingdom. Commission for Global Road Safety, 2006, p. 2. [Accessed June 1, 2009]. Available at http://www.makeroadssafe.org/publications/Documents/mrs_report_2007.pdf

Deaths and injuries from road traffic crashes are a major and growing public health epidemic. The World Health Organization has estimated that in 2002 almost 1.2 million people died in road crashes worldwide and as many as 50 million were injured. Unless action is taken, global road deaths are forecast to double by 2020 and yet many of these deaths and injuries are known to be preventable…
High income countries have developed effective road safety measures after decades of trial and error and human tragedy. While more effort is still needed in the industrialised nations the major challenge now is to ensure through early intervention that low and middle income countries do not have to experience the same bitter learning curve…
The World Report on road traffic injury prevention, published by WHO and the World Bank in 2004, details the key road injury 'risk factors', the major contributing factors to road crashes and injury severity, including drink driving; lack of helmet use; seat belt non compliance; excessive speed; and poor infrastructure design and management.

As a leading international organization -- if not the leading international organization -- devoted to building a safer world, the International Code Council can play an important role in solving this epidemic. At a minimum, even if it seeks no active role, the ICC will nonetheless be involved, because by specifying the key dimensions of so many public streets (i.e., the dimensions of fire apparatus access roads), the ICC's codes now play a major role in street design and therefore in road safety.

What Are Road Safety Risk Factors?
As the Commission for Global Road Safety's *Make Roads Safe* report notes, road safety specialists frequently refer to risk factors.

Primary Risk
The report notes that, "Primary risk describes the factors that contribute to the risk of occurrence of a road crash." Two of the four primary risk factors are *behavioral factors*, which are influenced by roadway dimensions and design, and the *road environment*, which is directly determined by roadway dimensions and design.[2]
According to the report, regarding behavioral factors:
Excessive or inappropriate speed is a key contributor to crash risk. Speed choice is influenced by the legal speed limit, but also by road layout...
According to the report, regarding road environment:
Road safety engineering and traffic management make a direct contribution to reduction of crash risk. Crash risk is increased by lack of attention to safety in both planning and design of new road networks and new roads. Road design affects road user behavior and crash risk through the speed the drivers will perceive as appropriate, through detailed design factors such as curves...
In modern road systems, vulnerable road users are disadvantaged because such systems are largely designed for the motor vehicle. The absence of footpath and cycle tracks, or traffic calming measures to reduce speed where pedestrians and cyclists mix with motorized traffic, increases the risk of a crash occurring and its severity.

Secondary Risk
"Secondary risk", the report explains, "includes the likelihood of injury occurring and its severity." As with primary risk, two of the major risk factors are behavioral factors, which are influenced by roadway dimensions and design, and the road environment, which is directly determined by roadway dimensions and design. As the report explains:
Impact speed is a crucial determinant of injury severity for vulnerable road users. For example, 90% of pedestrian survive impacts with cars at speeds up to 30 km/hour [18 mph], but more than half will die at speeds of 45 km/hour [27 mph] or more…
[F]or vehicle occupants also, injury severity increases with impact speed. The probability of fatal injury increases from close to zero to almost 100% as the change in impact speed increases from 20 km/hour to 100 km/hour…
Road design can also provide protection for vulnerable road users by reducing impact speed through traffic calming measures.

Other traffic safety research arises similar conclusions. For example, other research studies have found that when people walking are hit by a car:
- At 20 mph, only 5 percent of walkers are killed, most injuries are slight, and 30 percent suffer no injury;
- At 30 mph, 45 percent of walkers are killed, and many are seriously injured;
- At 40 mph, 85 percent of walkers are killed.[3]

Understanding the links between the dimensions of fire apparatus access roads and the likelihood of road traffic deaths and injuries on these roads
The transportation safety research literature makes clear that:
1. The behavior of motor vehicle drivers, bicyclists, pedestrians and other road users is substantially affected by the dimensions of streets.
2. Key roadway dimensions which have been found to significantly affect driver behavior include the following:
    a. roadway widths,
    b. lane widths,
    c. the presence or absence of raised medians, pedestrian refuges and similar measures (note that feasibility of including such measures in a roadway design is often dependent upon the requirements for roadway widths in the vicinity of these measures)
    d. the presence or absence of roundabouts, traffic circles, splitter islands and similar intersection design measures (again, note that feasibility of such intersection designs is highly dependent upon the requirements for roadway widths in the vicinity of these measures)
    e. turning radii (a.k.a. horizontal curvature) at curves in a roadway,
    f. turning radii (i.e., horizontal deflection) at roundabouts, traffic circles, median islands and channelized turns,
    g. curb radii at intersections,

3. The roadway dimensions and features described above affect important aspects of driver and pedestrian behavior. For example, the presence or absence of a raised median on a roadway affects the ability of drivers to make passing maneuvers, midblock turns or to drift into oncoming traffic.

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[2] Ibid. p. 60.
3 Limpert, Rudolph. *Motor Vehicle Accident Reconstruction and Cause Analysis*. Fourth Edition. Charlottesville, VA. The Michie Company, 1994, p. 663. See also *Killing Speed and Saving Lives*, United Kingdom Dept. of Transportation, London, England.

4. It is particularly important to note that the key roadway dimensions mentioned above affect the speed at which motor vehicle drivers choose to drive. As described above, motor vehicle speed is a key determinant of both the likelihood of a crash occurring and crash severity.
5. Because the dimensions of streets strongly affect the behavior of motorists, bicyclists, pedestrians and other road users, the dimensions of streets significantly affect traffic safety.

Section 503.2 of the current code sets specifications for the dimensions of fire apparatus access roads, including specifying the following key dimensions:

> fire apparatus access roads shall have an unobstructed width of not less than 20 feet;
> the required turning radii of fire apparatus access roads shall be determined by the fire code official.

While these two specifications are brief, their effect is far-reaching. By setting specifications for the key dimensions of road width and turning radii, Section 503.2 of the code sets specifications for many of the roadway dimensions and street design features (mentioned above) which are known to significantly affect traffic safety.

The following paragraphs provide several examples of the relationship between these two crucial street dimensions (roadway width and turning radii) and the ability to include important design features for traffic safety in a roadway design. In many circumstances, an absolute requirement to provide an unobstructed width of not less than 20 feet at every point along a roadway creates significant conflicts with the need to include roadway design features that improve traffic safety.

Often, these conflicts can be and have been resolved through careful design that consciously balances the need for traffic safety and the needs of firefighters to reach incidents and conduct fire and rescue operations. For example, while particular critical points along a roadway may be intentionally designed with a width of less than 20 foot clear, in order to reduce vehicle speeds and improve traffic safety, other areas along the same block will be provided with at least 20 foot clear, in order to provide, wherever necessary, sufficient space to set up equipment and fight fires.

The proposed appendix, by creating performance-based standards for fire apparatus access roads, will assist in the process of reconciling these conflicts. It provides more flexibility for street design, while still ensuring that streets are designed to allow for the passage of fire apparatus, and space to conduct fire and rescue operations.

Street Design for Traffic Safety: Examples

A few examples of roadway designs that can significantly improve traffic safety, but that frequently require roadway designs with less than 20 foot clear (at some, though not all places along a roadway) include the following:

1. Modern roundabouts
2. Raised medians
3. Low-volume local streets

Each is described in turn below.

1. Modern Roundabouts: The California Department of Transportation recently concluded, "The modern roundabout is now recognized nationally as an intersection type and traffic control treatment capable of providing unique and significant operational and safety benefits over a wide range of traffic volume and conditions. In particular, national research has confirmed that the single-lane version is especially effective in reducing collision frequency and/or severity for all highway users."[4]

Safety of modern roundabouts: Both overseas and in the United States, modern roundabouts have achieved a 50% to 90% reduction in injury accidents compared with intersections using stop control or traffic signals. The most comprehensive survey of roundabout safety in the United States was carried out in 1997 by the Transportation Research Board, and found that at intersections which were converted to roundabouts, overall crashes were reduced by 37% and injury accidents by 51%. The study also broke the results down for large roundabouts with three-lane entries, and smaller roundabouts with one- or two-lane entries. At these smaller roundabouts, crash reductions were even more pronounced: total crashes fell by 51%, with injury crashes reduced by 73%.

Capacity: roundabouts can often offer higher traffic-moving capacity than traffic signals, which in many circumstances leads to significantly reduced delays. The Transportation Research Board survey of intersections converted to roundabouts in the United States, for example, found that in the eight cases where vehicle delays had been measured, rush hour delays had been reduced by an average of 77%.

[4] *California Department of Transportation Design Information Bulletin #80-01: Roundabouts*. October 3, 2003, p. 1. [Accessed June 1, 2009]. Available at http://www.dot.ca.gov/hq/oppd/dib/dib80-01.pdf.

A typical modern roundabout in University Place, WA. At the roundabout entry, the clear width provided is only approximately 13 feet: this is an intentional design element to keep vehicle speeds low. Photo: IMG0032.jpg

Another modern roundabout near a school in Montpelier, VT. Again, note that the entry widths are kept to no more than 13 feet, to ensure low speeds both at the pedestrian crosswalks and within the intersection. Photo: IMG0027.jpg

The conflict between the current code requirement for 20 foot clear width at all points along every fire apparatus access road and the design of roundabouts occurs primarily with the design of roundabouts with one-lane entries. Roundabouts *are* designed to ensure that the largest fire apparatus (as well as tractor-trailer trucks and other large vehicles) that will use the roundabout are accommodated. However, as explained in

Roundabouts: an Informational Guide, the Federal Highway Administration's widely-used guide to roundabout design:

> *Roundabouts operate most safely when the geometry forces traffic to enter and circulate at slow speeds. Horizontal curvature and narrow pavement widths are used to produce this reduced-speed environment.* [5]

Furthermore, the Guide explains:

> *To maximize the roundabout's safety, entry widths should be kept to a minimum..The design should provide the minimum width necessary for capacity and accommodation of the design vehicle in order to maintain the highest level of safety. Typical entry widths for single-lane entrances range from 4.3 to 4.9m (14 to 16 ft); however, values…lower than this range may be required for site-specific design vehicle and speed requirements for critical vehicle paths.*

Thus, to design safe single-lane roundabouts, it is routinely necessary that at the roundabout entries, entry widths must be kept below 20 foot clear. This particular circumstance occurs only for a short distance at the intersection entry. However, it is a critical dimension and one that constantly conflicts with a requirement of 20 foot unobstructed width at all points along fire apparatus access roads.

2. Landscaped medians: There are important advantages to raised and landscaped medians, beyond their aesthetic appeal. In general, published studies conclude that on major roadways, raised central medians provide significant safety benefits when compared to undivided roads and roads with two-way left-turn lanes.

For example, examining overall crash rates – both midblock and intersection – for suburban arterials, Bowman & Vecellio's comprehensive study[6] found a rate of 373 vehicular crashes per million vehicle miles for roadways with a raised median, versus 676 vehicular crashes per million vehicle miles (or some 80% higher) for roadways with a two-way left-turn lane. Overall rates of rear end, right angle, head-on and left-turn crashes were all significantly reduced by the use of a median. Medians also ease crossings for pedestrians, and studies have found medians to be significantly safer for them. On suburban arterials, Bowman & Vecellio found the pedestrian crash rate for suburban arterials with raised medians to be 6.3 per million vehicle miles, versus 12.9 pedestrian crashes per million vehicle miles for those with two-way left-turn lanes.

The conflict that occurs here with the requirement for 20 foot clear is that many roadways only have room within the right-of-way for, and also function most safely (from the point of view of traffic safety) with one traffic lane and one bicycle lane in each direction on each side of the median. This results in a roadway cross section typically provides 17 feet of clear width on each side of the median.

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[5] *Roundabouts: An Informational Guide*. US Department of Transportation Federal Highway Administration Publication No. FHWA-RD-00-067. Washington, D.C., 2000. , p. 130. [Accessed June 1, 2009]. Available at http://www.tfhrc.gov/safety/00-0676.pdf.

6 B. L. Bowman and R.L. Vecellio. *Effect of Urban and Suburban Median Types on Both Vehicular and Pedestrian Safety*. Transportation Research Record No. 1445. TRB, National Research Council. Washington D.C., 1994.

An example of an undivided roadway. Photo: IMG0064.jpg

An example of a roadway with a raised median and approximately 17 feet of clear width on each side of the median. Photo: median.jpg

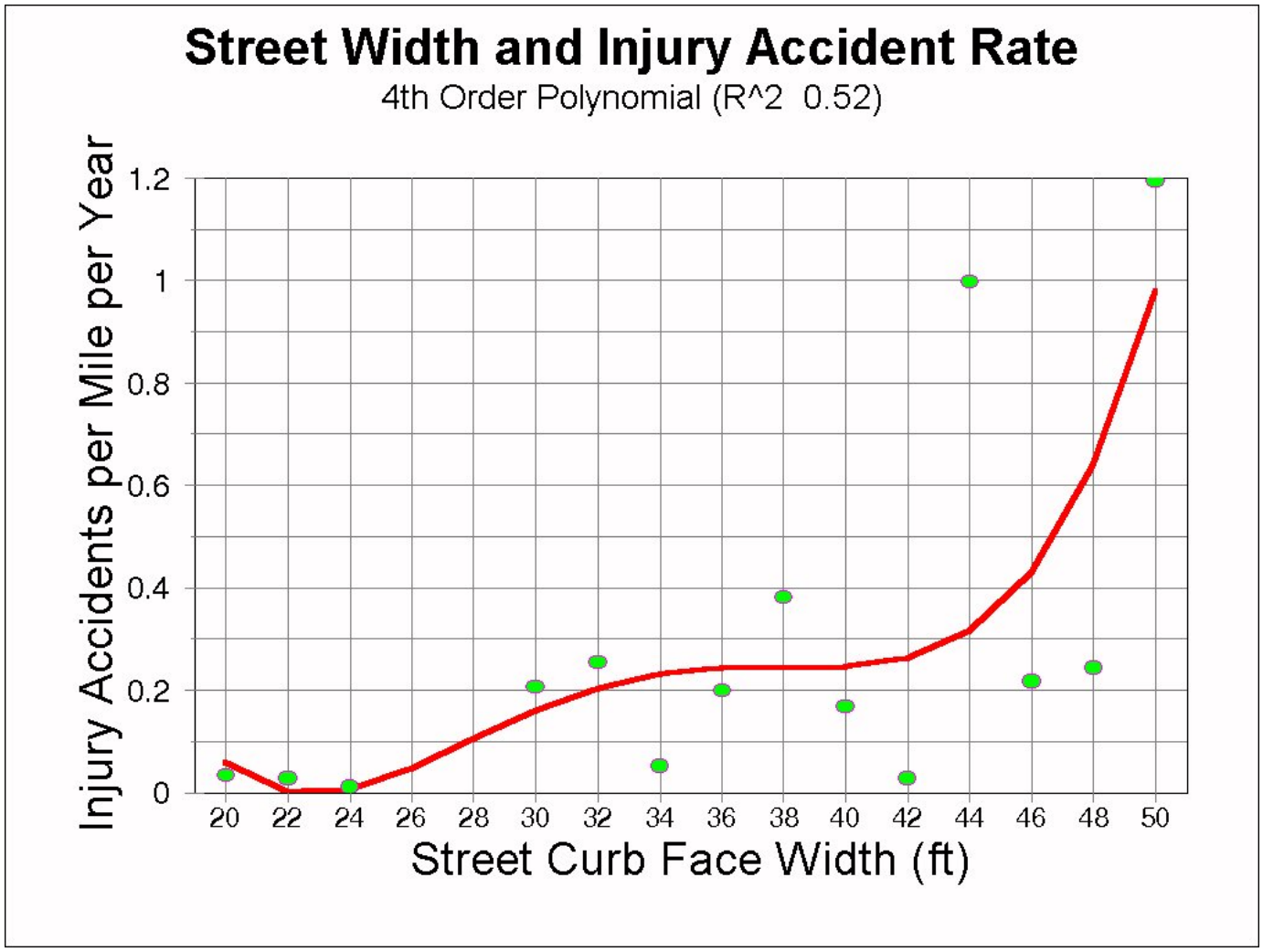
3. Local Street Standards: Low-volume local streets are often purposefully designed to enforce low-driving speeds, obviating the need for future retrofits with speed bumps and other harsh traffic calming measures that can severely impact fire apparatus. For best traffic safety result, these minor residential streets are consciously designed to maintain average speeds of 20 mph or less. To achieve this, low-volume local streets are designed as traditional "yield streets". As the Institute of Transportation Engineers' Residential Streets, Third Edition explains:

> *Yield flow occurs when two-way traffic is impossible where parked vehicles are present. Thus, some motorists must stop and yield the right-of-way to oncoming vehicles. For decades prior to the 1960's, yield flow was the widely accepted norm for local streets. …Most local streets with low ADT [average daily traffic] may have yield-flow operation.*[7]

The AASHTO Greenbook, the standard reference on the geometric design of streets, also explicitly endorses yield streets:

> *The level of user inconvenience occasioned by the lack of two moving lanes is remarkably low in areas where single-family units prevail… In many residential areas a 26-ft.-wide roadway is typical. This curb-face-to-curb-face width provides for a 12-ft. center travel lane and two 7-ft. parking lanes. Opposing conflicting traffic will yield and pause on the parking lane area until there is sufficient width to pass*.[8]

The traffic safety research literature finds that yield streets result in a strong reduction in injury accident rates. Recent research compared injury accidents per mile per year on local streets against thirteen physical characteristics.[9] Street width was found to be significantly related to injury accidents, with the authors concluding that, "as street width widens, accidents per mile per year increases exponentially." The study's regression analysis found that a typical 36-foot wide residential street has 0.16 accidents per mile per year as opposed to 0.03 accidents per mile per year for a 24 foot wide street. This difference is about a 487 percent increase in accident rates (see figure, below). The safest streets were the narrow, 24-foot wide streets, with parking allowed on both sides, resulting in a clear width of approximately 10 feet.



[7] Kulash, Walter. *Residential Streets, 3rd Edition*. Washington, D.C.: Institute of Transportation Engineers, National Association of Home Builders, American Society of Civil Engineers, and Urban Land Institute, 2001.
[8] American Association of State Highway and Transportation Officials. A Policy on Geometric Design of Highways and Streets (a.k.a. the AASHTO Greenbook). Washington, D.C.: AASHTO, 1990.
[9] Swift, Peter, Dan Painter, AICP and Matthew Goldstein. *Residential Street Typology and Injury Accident Frequency*. Denver, Colorado: Swift & Associates, 2006.

Photo: 4THORDER.JPG

On low-volume local streets, providing widths of less than 20 foot clear can clearly provide numerous traffic safety benefits. The conflict between creating yield streets to meet this traffic safety goal, and the goal of ensuring safe access for fire and rescue operations, has been reconciled in numerous different ways by different jurisdictions. Frequent solutions include requiring that such streets always be through streets (rather than cul-de-sacs); requiring such streets to provide locations with 20 foot clear width at regular intervals (e.g., at all fire hydrants), so that areas exist to allow fire engines to set up and hook up hoses; and limiting building heights on such streets, so that is not necessary to deploy aerial ladders.

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Cost Impact: The code change proposal will not increase the cost of construction

ICCFILENAME: SIEGMAN-SWIFT-NORQUIST-F1-APPENDIX K.DOC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's reason statement and felt that the proposal would provide a good starting point for community planning that takes into account the need for road traffic safety in fire apparatus access road design.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

John Norquist, representing Congress for the New Urbanism (CNU) and self, requests Approval as Submitted.

F237 (Appendix K), is an optional, performance-based guidance to fire code officials on street design. It provides flexibility based on local conditions and desires without jeopardizing public safety. For example, instead of a strict 20-foot-clear requirement, Appendix K recognizes street widths and vertical clearances that permit “passage of the jurisdiction's fire apparatus and, wherever necessary, provides adequate space for deploying the jurisdiction's fire apparatus and for conducting fire and rescue operations.” This is not overreaching, nor does it contain extraneous information; this is a guide that is flexible enough to be applied as local conditions merit or require, across the United States. It also is flexible enough to apply in countries that adopt the IFC, but whose urban development patterns and cultural norms greatly differ from the U.S. It should be adopted as is. As such, more detailed descriptions of street design conditions are merited as background information for guidance in good street design elements.

Public Comment 2:

Carl D. Wren, Austin TX Fire Department, representing self and Page Dougherty representing self, request Approval as Modified by this Public Comment:

Modify the proposal as follows:

APPENDIX K
STREET DESIGN GUIDELINES FOR ALTERNATIVE FIRE APPARTUS ACCESS ~~SAFETY~~

~~The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.~~ This Appendix is for information purposes and is not intended for adoption.

SECTION K101
GENERAL

K101.1 Intent. The purpose of this appendix is to ~~allow~~ provide guidance to jurisdictions ~~to~~ that choose to adopt a performance-based ~~requirements~~ design approach for fire apparatus access roads in cooperation with the design community, ~~in order to achieve all of the following purposes:~~
~~1. Establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations.~~
~~2~~ The design guidance in this appendix can be utilized to evaluate ~~On the~~ new and existing fire apparatus access roads required by ~~and regulated by~~ this code.~~,~~ It can be used to establish design criteria ~~requirements~~ that are consistent with nationally and internationally recognized good practices ~~for~~ in an effort to ~~achieving a reasonable level of~~ improve traffic ~~overall life~~ safety, by taking into account ~~and balancing the need to~~ methods for preventing roadway traffic deaths and injuries ~~and the need to safeguard against the~~ while providing access for emergency responders who work to mitigate the hazards of fire, explosions and other emergencies ~~dangerous conditions~~.

~~**K101.2 Scope.** If this appendix is adopted by a jurisdiction, then the following changes to the current provisions of the code come into effect within the jurisdiction:~~

K101.2 ~~Scope~~ Goals. This ~~code establishes regulations~~ appendix addresses access and traffic safety concerns affecting or relating to structures, processes, premises and safeguards that impact or potentially impact ~~regarding~~:

~~1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices;~~
~~2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises;~~
~~3. Conditions hazardous to life, property or public welfare on or relating to the design of fire apparatus access roads, including the hazards of traffic, fire, explosion and other dangerous conditions;~~
~~4. Fire hazards in the structure or on the premises from occupancy or operation;~~
~~5. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems.~~
~~6~~ 1. ~~Conditions affecting t~~The safety of fire fighters and emergency responders in route to, during, and returning from an emergency ~~operations~~.
2. ~~Permit s~~Safe passage of the jurisdiction's fire apparatus
3. The adequacy of space for deploying the jurisdiction's fire apparatus and conducting fire and rescue operations
4. The approach and departure angles for the apparatus, and the inside and outside turning radii.
5. Appropriate vehicle speeds during normal traffic conditions that can enhance the safety of vehicles drivers and passengers as well as pedestrians.

~~**101.3 Intent.** The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations. Additionally, on the new and existing fire apparatus access roads required by and regulated by this code, the purpose of this code is to establish requirements consistent with nationally and internationally recognized good practice for achieving a reasonable level of overall life safety, by taking into account and balancing the need to prevent road traffic deaths and injuries and the need to safeguard against the hazards of fire, explosions and other dangerous conditions.~~

~~**503.2.2**~~ **K101.3 Authority.** The fire code official ~~shall~~ needs to have the authority to work ~~require an increase~~ in conjunction with the jurisdiction's traffic engineer to provide the ~~minimum~~ access widths ~~where they are inadequate~~ needed for fire or rescue operations. The jurisdiction also a needs to address other commercial vehicle requirements such as trash, recycling vehicles, and moving vans so that their presence will not delay emergency response vehicles.

~~**503.2.1**~~ **K101.4 Dimensions.** Fire apparatus require access roads ~~shall have an~~ of sufficient unobstructed widths ~~of not less than 20 feet (6096 mm)~~, exclusive of shoulders, to allow the passage of and effective deployment of the jurisdiction's emergency apparatus~~, except for approved security gates in accordance with Section 503.6,~~ and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

~~**503.2.4**~~ **K101.5 Turning radius.** The required turning radius of a fire apparatus access road shall be ~~determined by the fire code official~~ based on the turning radius of both the in-service and the reserve apparatus used by the fire department, and other commercial vehicles that will operate in the area. ~~provide for the passage of the jurisdiction's fire apparatus.~~

~~**503.2.7**~~ **K101.6 Grade.** The grade of the fire apparatus access road shall be ~~within the limits established by the fire code official~~ based on the fire department's apparatus and the limitations of the apparatus related to ascending and transitioning from a flat surface to the grade permitted by the jurisdiction, and descending from a flat surface to the grade permitted by the jurisdiction. In addition, a transitioning distance may be required from the flat surface to the full grade. ~~limited to grades that permit passage by, and, wherever necessary, fire and rescue operations by, the jurisdiction's fire apparatus.~~

~~503.2.8~~ **K101.7 Design for road traffic safety.** Fire apparatus access road~~s shall be~~ design~~ed and maintained~~ should be influenced by the nature of the area being served, including building dimensions, building occupancies and uses, pedestrian traffic, bicycle traffic, and parking patterns.~~, so as to minimize road~~ The potential design impact on traffic safety should be evaluated to identify possible improvements that help to minimize inappropriate vehicle speeds for the area but do not prevent ~~deaths and injuries, while maintaining~~ adequate access ~~provision~~ for ~~the passage of~~ fire apparatus and for fire and rescue operations. ~~To achieve these goals, fire apparatus access roads shall be designed and maintained to both: (a) permit passage of the jurisdiction's fire apparatus and, wherever necessary, provide~~ Adequate access includes ~~adequate~~ the space necessary for deploying the jurisdiction's fire apparatus and conducting fire and rescue operations~~; and (b) minimize excess and inappropriate vehicle speeds~~.

Commenter's Reason (WREN): This code change was moved by Mr. Crawford of the IFC Code Development Committee with the idea to continue the discussion between the fire service and project developers, engineers and planners. Along with several fire service representatives I have been engaged in a dialogue with the Congress for the New Urbanism (CNU) for over two (2) years, and like Mr. Dougherty and Mr. Crawford, I would also encourage discussion of projects by all the stakeholders with an interest.

The original proposal and this comment are intended to be appendix material. The proposal was intended to be an adoptable appendix but it was not written in mandatory language throughout. This comment proposes to make the appendix a guidance document, to provide a potential process for dealing with this complex subject by both fire code officials and developers in order to further the dialog. I hope the on-going discussions will offer the possibility of a future change with mandatory language that would be mutually acceptable to the urbanist community and to the fire service.

If adopted, this code change would generate a new appendix worded as follows:

K101.1 Intent. The purpose of this appendix is to provide guidance to jurisdictions that choose to adopt a performance-based design approach for fire apparatus access roads in cooperation with the design community.

The design guidance in this appendix can be utilized to evaluate new and existing fire apparatus access roads required by this code. It can be used to establish design criteria that are consistent with nationally and internationally recognized good practices in an effort to improve traffic safety, by taking into account methods for preventing roadway traffic deaths and injuries while providing access for emergency responders who work to mitigate the hazards of fire, explosions and other emergencies.

K101.2 Goals. This appendix addresses access and traffic safety concerns affecting or relating to structures, processes, premises and safeguards that impact or potentially impact:

1. The safety of fire fighters and emergency responders in route to, during, and returning from an emergency.
2. Safe passage of the jurisdiction's fire apparatus
3. The adequacy of space for deploying the jurisdiction's fire apparatus and conducting fire and rescue operations
4. The approach and departure angles for the apparatus, and the inside and outside turning radii.
5. Appropriate vehicle speeds during normal traffic conditions that can enhance the safety of vehicles drivers and passengers as well as pedestrians.

K101.3 Authority. The fire code official needs to have the authority to work in conjunction with the jurisdiction's traffic engineer to provide the access widths needed for fire or rescue operations. The jurisdiction also a needs to address other commercial vehicle requirements such as trash, recycling vehicles, and moving vans so that their presence will not delay emergency response vehicles.

K101.4 Dimensions. Fire apparatus require access roads of sufficient unobstructed widths, exclusive of shoulders, to allow the passage of and effective deployment of the jurisdiction's emergency apparatus and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

K101.5 Turning radius. The required turning radius of a fire apparatus access road shall be based on the turning radius of both the in-service and the reserve apparatus used by the fire department, and other commercial vehicles that will operate in the area.

K101.6 Grade. The grade of the fire apparatus access road shall be based on the fire department's apparatus and the limitations of the apparatus related to ascending and transitioning from a flat surface to the grade permitted by the jurisdiction, and descending from a flat surface to the grade permitted by the jurisdiction. In addition, a transitioning distance may be required from the flat surface to the full grade.

K101.7 Design for road traffic safety. Fire apparatus access road design should be influenced by the nature of the area being served, including building dimensions, building occupancies and uses, pedestrian traffic, bicycle traffic, and parking patterns. The potential design impact on traffic safety should be evaluated to identify possible improvements that help to minimize inappropriate vehicle speeds for the area but do not prevent adequate access for fire apparatus and for fire and rescue operations. Adequate access includes the space necessary for deploying the jurisdiction's fire apparatus and conducting fire and rescue operations.

I hope that the membership will bring forward this Public Comment or Mr. Dougherty's comment and support Approved as Modified by the one of these two Public Comments.

Commenter's Reason (DOUGHERTY): This code change was moved by Mr. Crawford of the IFC Code Development Committee with the idea to establish a discussion between the fire service and project developers, engineers and planners. I would also encourage discussion of projects by all the stakeholders with an interest in the project.

Unfortunately, the code change proposal as approved has a lot of unneeded text in it that is more like commentary language than code. Most of the proposal is not written in mandatory language, as it is intended as a discussion guide. There are also portions of the proposal that do no more than restate the intent of the code as found in Chapter 1 and Chapter 5 of the IFC .

In discussing my concerns with the proponents of F237 and Mr. Crawford regarding the technical deficiencies, I offered to edit the original proposal to make it read more like a code should read and maintain the main concerns of the proponent: When developing a project, the concepts of livable – walkable communities that encourage people to use alternate modes of transportation, reduce traffic and the resulting traffic accidents and fatalities, to get people out walking within the community improving the health of the community, to reduce the carbon foot print in the community - reducing green house gasses and global warming, to produce sustainable housing (green buildings) that are energy efficient. With all of these it is felt that a better designed community can be the result.

The resulting modification was reviewed by the Congress for New Urbanization (CNU) and Mr. Crawford in an effort to provide an appendix that is simple and can achieve the goals of all concerned.

I urge the membership to bring forward the Public Comment; overturn the committee action to Approve as Submitted, and support Approved as Modified by the Public Comment as shown in this proposal.

Note: Mr. Crawford and I attended the CNU Conference in November 2009 to assist them in establishing a dialogue with the fire service. While at the conference we attended a meeting with the fire service and the CNU regarding access issues, which I thought was beneficial to both groups. I have also submitted a Public Comment for Disapproved. If the modified proposal is not acceptable to the membership I would then ask for disapproval. The language in the proposal approved by the committee does not belong in the code or Appendix and needs to be rejected.

Public Comment 3:

Page Dougherty representing self, requests Disapproval.

Commenter's Reason: The code change was "Approved as Submitted" by the committee in the final minutes of the code hearings. It was brought to the committee's attention that the text of the proposal was filed with direct cut of paste of existing code text, including the existing section numbers. The language used was also pointed out to be more commentary type language than that used in code.

Mr. Crawford, who made the motion to Approve F237, indicated that code users need to reach out to the submitter's group to establish a dialogue with firefighters and their group. This has been done as Mr. Crawford and I attended the group's conference in November, 2009 to establish that dialogue and also attended a meeting of that group and the fire service from the Oregon and Washington areas.

The code change as Approved is terrible code language and does little more that provide a laundry list of items that should be included in the discussion between the development community and the fire service. It should not be accepted by the membership as written.

Note: An additional Public Comment has been submitted in an attempt to remove the commentary type language, rearrange the issues to be discussed in a code like manner, and most importantly notes that the Appendix should not be adopted as part of a Code.

If the other Public Comment meets the concerns regarding the issues, vote for it over the Approved version of F237, If you do not like the Public Comment then I ask for your support of a Disapproval vote to prevent the Approved text form being placed in the code.

Remember this is the ONLY CHANCE we have TO REMOVE the F 237-09/10 text as approved for the 2012 IFC

Public Comment 4:

Daniel E. Nichols, New York State Div. of Code Enforcement and Administration, requests Disapproval.

Commenter's Reason:

The committee approved this 'as a starting point', but the proposal has requirements that are located in confusing locations, based on unidentified standards, as well as being detrimental to fire department apparatus.

If a jurisdiction were to adopt this appendix, the following issues would be raised:

<u>K101.2</u>

Modifies 101.2- Scope of the IFC- This would make the fire code official responsible for the hazards of traffic that occur on fire apparatus access roads, including 'other dangerous conditions.'

Modifies 101.3- Intent of the IFC- This would make the design of existing fire apparatus access roads subject to construction requirements. Currently, IFC Section 503.1 only applies the design criteria to newly required fire apparatus access roads.

Modifies 503.2.1- Dimensions- States that the 20 feet would be deleted and adds 'the passage of fire apparatus'. The passage of fire apparatus is not the sole intent of the 20 feet; it is so fire apparatus can pass one another when navigating a fireground as well as to go around a vehicle that has pulled over to allow the fire apparatus to proceed. Another concern is the term 'Wherever necessary, provides adequate space for deploying apparatus. Where will this be? What about other buildings built along the road at a later date? What happens when the fire department's vehicles change? The 20 feet has been long recognized as the required width to effectively operate fire apparatus.

Today's fire apparatus is much larger than a generation ago; mainly because of increased safety features within the apparatus (enclosed cabs, side impact protection, aerial apparatus stability), the need for multiple-use apparatus that decreases the number of vehicles but make each one larger (quint-type and rescue-pumper apparatus), and new environmental concerns. The environmental concerns are based on new Environmental Protection Agency (EPA) requirements on diesel engines that require larger-sized engines to be placed in fire apparatus to more effectively control pollutants. The larger engines have made apparatus wider to facilitate the space for the engine and the associated cooling. As an example, a 1950's city engine was about 80" wide, a mid-1990's city engine was about 92" wide plus 10" for mirrors. Today's fire apparatus utilizes about 100" wide, with an additional 10" for mirror. In short, two late-model fire engines will have only about 20" of space to pass with the current 20 feet requirement. Anything less than 20 feet changes the original purpose of fire apparatus access roads.

On-street parking is a principle of the new urbanism movement. Because of the need for parallel parking, rapid increases of 'double-parkers' due to no dedicated parking within immediate proximity of the residences, and largely unregulated parking of larger vehicles, on-street parking is an additional issue that effects fire apparatus access where the minimum width is generally diminished anyway. Add the issue of snow removal in colder climates and on-street parking becomes a real hindrance to narrow roads.

The appendix material does not give the appropriate guidance to take into account the above issues, as well as others dealing with need for considerations of future fire department apparatus purchases, vehicle height and access to buildings. It also does not give the review and approval process that other performance-based designs have, such as the criteria in the alternate methods and materials process in Chapter 1 of the IFC or as developed in the *ICC Performance Code*.

I ask that the membership consider disapproving this code change. I want to also remind the ICC membership that F16 was disapproved by the committee for reasons (in part) of the fire code official not being in control of the width of roads and F17 was approved to prohibit traffic-calming devices unless approved by the fire code official because of the known reduction of fire apparatus access created by contemporary road designs.

Final Action: AS AM AMPC____ D

F241-09/10
4603.6.1 (New), 4603.6.1.1 (New), 4603.6, Table 4603.1

Proposed Change as Submitted

Proponent: Tom Lariviere, Chairman – Joint Fire Service Review Committee

1. Add new text as follows:

4603.6.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group A occupancies having an occupant load of 300 or more. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

4603.6.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies with an occupant load of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.6.2.2.

Exception: Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.

(Renumber subsequent sections.)

2. Revise as follows:

4603.6 Fire alarm systems. An *approved* manual, automatic or manual and automatic fire alarm system shall be installed in existing buildings and structures in accordance with Sections 4603.6.1 through ~~4603.6.7~~ 4603.6.8 and provide occupant notification in accordance with Section 907.6 unless other requirements are provided by other sections of this code.

Exception: Occupancies with an existing, previously *approved* fire alarm system.

TABLE 4603.1
OCCUPANCY AND USE REQUIREMENTS

Section	Use			Occupancy Classification																		
	High Rise	Atrium or Covered Mall	Under ground Building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
4603.6.1				R																		
~~4603.6.1~~ 4603.6.2						R																
~~4603.6.2~~ 4603.6.3													R									
~~4603.6.3~~ 4603.6.4														R								
~~4603.6.4~~ 4603.6.5															R							
~~4603.6.5~~ 4603.6.6																		R				
~~4603.6.6~~ 4603.6.7																			R			
~~4603.6.7~~ 4603.6.8																					R	

(Portions of table and notes not shown remain unchanged)

Reason: A study of multiple casualty fires in assembly occupancies has shown that similar conditions existed in all of the fires. These conditions include interior finish, exiting and occupant notification issues. The IFC addresses egress and interior finish issues retroactively in existing buildings. While the IFC contains retroactive fire alarm provisions in Groups E, R and I, there are currently no requirements for fire alarm systems in existing Group A occupancies. In the Beverly Hills Supper Club Fire (1977) and the Coconut Grove Fire (1942) one important factor resulting in 657 fatalities was the lack of occupant notification. In both these fires, multiple assembly rooms created conditions where the occupants of the buildings were not aware of fire conditions elsewhere in the building. Delayed occupant notification resulted in the fire condition blocking exit routes that would have been available earlier in the incidents.

This proposal will require a manual fire alarm system in existing Group A buildings with an occupant load of 300 or more.

Section 4603.6 is revised to include the new sections in the reference.

Table 4603.1 is revised to include the new sections in the reference.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: LARIVIERE-F34-4603.6.1.doc

Public Hearing Results

Note: This code change was contained in the errata posted on the ICC website. Please go to http://www.iccsafe.org/cs/codes/Pages/09-10ProposedChanges.aspx.

Committee Action: **Disapproved**

Committee Reason: The committee felt that the proposal would be in conflict with the action taken on code change F100-09/10 which clarifies the same requirements for new Group A occupancies and provides for Group A occupancies that are separated from one another.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joe Pierce (Chairman), Dallas Fire Department, representing Joint Fire Service Review Committee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

4603.6.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group A occupancies ~~having an~~ where the occupant load ~~of~~ due to the assembly occupancy is 300 or more. Group A occupancies not separated from one another in accordance with Section 707.3.9 of the *International Building Code* shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

> **Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This proposal was Disapproved at the Code Development Hearing because it was not consistent with the Committee's action on F100-09/10. This Public Comment revises the text so that it is consistent with the F100-09/10 which revised Section 907.2.1. Therefore, the second sentence is added which refers to considering all Group A occupancies when they are not separated with fire-rated construction.

The need to install fire alarms systems in large existing Group A occupancies exists. We hear of tragic incidents in these facilities all too often. Now that this proposal is correlated with 907.2.1, it should be approved so that occupants in existing Group A occupancies can be protected as well.

Analysis: The text of Section 907.2.1 resulting from the Approval as Submitted of code change F100-09/10 (appears on the Final Action Hearing Consent Agenda), reads as follows:

907.2.1 (IBC [F] 907.2.1) Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more. Group A occupancies not separated from one another in accordance with Section 707.3.9 of the *International Building Code* shall be considered as a single occupancy for

the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Final Action: AS AM AMPC____ D