

**TRANSIT INDUSTRY INTERFACE WITH
INTERNATIONAL STANDARDS**

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Transit Industry Interface with International Standards

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Introduction

Globalization and rapid progress in microprocessor electronics are making international standards of increasing importance in the transit industry. Because of globalization the supply industry is becoming increasingly international in nature. Regional or national standards require separate products for each market and, given the small size of the transit industry, this adds significant cost. On the other side, the impact of new technologies such as microprocessors provides opportunities for significant cost savings. But these benefits will be lost if incompatible communication protocols and data conventions prevent the integration of these new technologies into a working unit. Even more serious is the possibility that separate procurements of cars and other equipment will not be compatible with each other.

To assist the U.S. transit industry to determine how to best participate in international standards activities, the National Academies have funded TCRP J6 (48), *Transit Industry Interface with International Standards*. The purpose of the project is to explain the roles and responsibilities of current and potential participants in the international standards process and identify the requirements associated with managing the transit industry's interface with this process. The project scope includes a policy level description of international standards activities including 1) laws, regulations and international treaties from a North-American perspective; 2) institutional structures governing these standards activities; 3) level of participation and support currently provided by various nations and economic blocs; and 4) requirements associated with managing a coherent industry participation in this process.

In organizing the report the requirements associated with managing a coherent industry participation have been placed first, to provide an executive summary. Those interested in the more detailed information which supports these recommendations will find it helpful to read the body of the report also. This begins with a description of international and regional agreements and organizations governing standards, followed by a discussion of federal laws and regulations related to standards, and a summary of the role of the National Institute of Standards and Technology (NIST) and the recently developed *U.S. National Standards Strategy* document. The report concludes with a description of current transit industry participation on key international transit standards committees, a discussion of the level of participation and support of various nations and economic blocs, and a discussion of copyright issues.

Conclusions and Recommendations – A Suggested Approach for Coherent Transit Industry Participation in International Standards

At the present time, there are a number of international transit standards activities underway which have tended to develop independently. These include Intelligent Transportation Systems (ITS) standards activities within the International Organization for Standardization (ISO), train and train control standards within the International Electrotechnical Commission (IEC), automated people mover standards being developed through the American Society of Civil Engineers (ASCE), and Asia-Pacific Economic Cooperation (APEC) activities. There is a need for a coordinated overall strategy to provide a coherent industry approach towards international transit standards. This section is intended to present some key elements which need to be incorporated into such a strategy and identify the policy decisions which they require.

ITS Transit Standards The United States serves as the secretariat or lead nation in charge of ISO Technical Committee 204 (TC 204), Intelligent Transportation Systems, giving it a key role in this area. Transit ITS standards are the province of Working Group 8, led by Alan Kieper, the former general manager of transit agencies in Atlanta, New York City and Houston. In addition to transit, this working group is also responsible for emergency services standards. In the past, there has been some difficulty obtaining European support for U.S. proposed ITS transit standards. A contributing factor has been a lack of unified and committed support for these standards within the U.S. transit industry itself.¹ The American Public Transportation Association (APTA) has recently assumed leadership for U.S. development of transit ITS standards under a contract from the Federal Transit Administration. It has been suggested that APTA become involved internationally by participating as a voting member on the TC204 Technical Advisory Group and by considering sponsorship of the Working Group 8 advisory group.² APTA involvement could serve as a catalyst for greater transit industry participation in the ITS area.

The other major ISO transit standards area is ISO Technical Committee 22 (TC 22), Road Vehicles, which deals with standards for all types of road vehicles including trucks and buses. Within APTA there is presently significant bus standards work underway supported by Transit Cooperative Research Program (TCRP) Project C-14.³ Since most transit bus procurement in the United States involves global suppliers, consideration might be given to internationalizing this standards work through either the ISO TC22 or possibly ISO TC 204 committees.

¹ Based on comments from Working Group 8 leaders and experts at a meeting on ITS standards held at ITS headquarters in Washington D.C. on November 3, 2003 attended by Alan Kieper, Paula Okunieff, David Matta, Paul Najarian, Tom Kuhihara, Gerry Flood, Ging Ging Liu, Koorosh Olyai, Bill Kronenberger, Brian Cronin, Walter Kulyk, Andy Schoka, Susan Proper, Lou Sanders and the author.

² Suggestion made by Paul Najarian, Secretary of TC 204 and Koorosh Olyai, chair of the advisory group to Working Group 8 at the meeting documented in note 1.

³ *Transit Cooperative Research Program Annual Report of Progress, 2003*, Transportation Research Board, Washington DC, p60.

Rail Transit Standards IEC Technical Committee 9 (TC9), Electrical Equipment and Systems for Railways, is the IEC body charged with electrical rail standards. Here, the situation is somewhat different from ISO TC204. The committee is led by European Union nations and, in the past, U.S. transit involvement has been minimal. This began to change in 1996 when TCRP Project G-4 was initiated to develop U.S. transit industry standards using the Institute of Electrical and Electronic Engineers (IEEE).⁴ As an outgrowth of this IEEE work, the U.S. now participates in TC9 Working Group 40 which is developing urban guided transit command and control standards. In this working group, the IEEE communications based train control standard developed through the TCRP G-4 effort is being used as a resource. The U.S. is also participating in TC9 Working Group 39, which is developing standards for automated people movers and is using the American Society of Civil Engineers (ASCE) *Automated People Mover Standard* as a resource.

There have been communications problems with U.S. support of TC9. Lack of funding to support an IEC effort, has resulted in sporadic attendance at TC9 meetings, and occasionally in the United States failing to cast a ballot on issues where there are U.S. commercial and technical interests at stake.⁵ Several steps have been taken recently to improve this situation. The IEEE Standards Association has accepted the role of TA/TAG Administrator for the United States, and has assigned Tricia Gerdon of their staff to that function. Ms. Gerdon also provides staff support for the IEEE Rail Transit Vehicle Interface Standards Committee formed by TCRP G-4. Under the operating procedures governing involvement of the U.S. delegation to TC9, a person designated as the “Technical Advisor” plays a key role in assembling a technical advisory group and determining the U.S. position on issues. An APTA representative was recently appointed to this office, so the U.S. transit industry is now well positioned to play a meaningful role should this prove to be a desirable policy.

Need for Meaningful ISO/IEC Involvement With any of these ISO or IEC technical committees, a half hearted commitment will not be productive. The work of these committees depends heavily on personal relationships which require attendance at technical committee meetings held at rotating locations around the globe. While alternate persons can be delegated to attend meetings, one person should show a clear and continuous presence to develop the personal relationships which are so essential. There appear to be two credible ways to move forward in the ISO/IEC arena: either take a proactive role by locating sufficient funding to permit a major U.S. presence on technical committees, subcommittees and working groups; or concentrate primarily on keeping informed on what is happening and how it might impact U.S. transit, without attempting to lead or influence the process per se. The United States already has a leadership role in ISO TC204, and has significant funding sources. On the other hand, at this point, we have

⁴ Ibid, p63.

⁵ An example occurred recently when ballots by TC9 working groups 39 and 40 were underway and neither of the two U.S. representatives was notified. In another case the United States cast its ballot on the ISO communications protocol standard contrary to the position of the IEEE committee developing such standards for the U.S. industry under a Federal contract.

essentially no funding to support IEC TC9 efforts. Therefore, it is possible the decisions with regard to how to support these two committees may not necessarily be the same.

Keeping Informed In order to take the minimal steps necessary to keep the transit industry properly informed on ISO/IEC standards activities, the following actions are suggested. With regard to ISO TC 204, APTA should consider joining the Technical Advisory Group as a voting member. An effort should also be made to spin off emergency services out of Working Group 8, so that public transit has its own working group. Ambulance, fire, police and similar activities are extremely important, but are not a natural fit with public transit. With regard to IEC TC9, discussions with IEEE should be conducted to determine the proper operating procedures for the U.S. delegation with regard to division of labor between the Technical Advisor (from APTA) and the TA/TAG Administrator (from IEEE). Sufficient funding should be obtained to support both the TA and the TAG Administrator in a minimal function of 1) locating experts and delegates to attend IEC meetings at their own expense 2) Properly distributing important technical communications to interested parties using the APTA/IEEE transit standards committees which already exist as a vehicle. 3) Seeing that a U.S. consensus position is developed and that the U.S. ballots on issues before the committees.

Additional Actions Needed to Take a Lead Role If the decision is to take a lead role on these committees, additional actions are recommended. With regard to ISO TC 204, APTA should consider sponsoring the Working Advisory Group to WG8, thereby taking a lead responsibility for developing industry consensus positions with regard to ITS transit standards. Funding would also have to be secured to permit attendance by transit agency personnel at both international meetings and U.S. meetings so that the U.S. position includes this critical input. If the proactive approach is chosen, we would also recommend that consideration be given to integrating APTA bus standards activities with either TC204 or TC22. Transit buses in the United States are presently procured globally and international standards could provide cost economies.⁶

With regard to the IEC TC9 activities, significant funding to support travel would also be needed, in much the same way as was described for the ISO effort. Funding would have to be secured to permit 1) regular attendance by a single individual as head of the U.S. delegation to TC9 and 2) periodic attendance by transit agency personnel to both international meetings and U.S. meetings so that the U.S. position includes their input.

Need to Determine an Accurate Consensus Because the United States can only cast a single vote on issues before IEC and ISO committees, it is essential that a valid consensus of U.S. industry opinion be obtained prior to balloting. On IEC committees, the Technical Advisor (one person) casts the vote. USNC procedures state that this person should have a Technical Advisory Group or TAG, but this TAG can consist of as

⁶This measure has been recommended by both Alan Kieper and Koorosh Olyai at the meeting described in note 1.

few as three persons.⁷ Such a small group may not always accurately reflect the industry position, posing the risk of a real or perceived special interest bias.

ANSI operating procedures address this concern for ISO committees by encouraging designation of the applicable ANSI accredited standards organization as the TAG.⁸ Even so, the need to develop a broad-based consensus remains critical. Koorosh Olyai, who chairs the TC204 Working Group 8 advisory group, notes that it has proven difficult to get consistent and broad based U.S. transit industry participation.⁹

As has been noted, APTA sponsorship of the WG8 WAG would be a way to obtain this industry participation. Because of its lead role in transit industry standards activities, APTA is well positioned to determine the U.S. (and possibly North American) consensus on international standards issues. Through its direct involvement in its own APTA transit standards activities, as well as its sponsorship and involvement with IEEE, American Society of Mechanical Engineers (ASME) and American Association of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) standards work, APTA has access to standards committees with technical expertise in virtually all areas of bus and rail technology and, by referring issues to these committee chairs and through them to the committees, should be able to obtain an accurate U.S. position.¹⁰ As a membership organization with suppliers, transit agencies and consultants, APTA has the broad base which can mitigate against the risk of special interest dominance inherent in the one nation one vote system.

Some Funding Considerations In addition to the usual transit industry sources, the National Institute of Standards and Technology (NIST) provides “highly-specialized technical assistance to help industry develop voluntary consensus-based standards.”¹¹ It would be worthwhile for the transit industry to open up lines of communications with NIST. Even if direct funding is not available, the NIST has significant staff and resources which could possibly complement or assist transit industry efforts.

⁷ *Operating Procedures For USNC/IEC Technical Advisory Groups (USNC/IEC Tags)*, approved by USNC Technical Management Committee by Letter Ballot 14, January 2002 and confirmed at the TMC Meeting on 17 January, Section 3.1 c).

⁸ *ANSI Procedures for U.S. Participation in the International Standards Activities of ISO*, January 2003 edition, issued May 1, 2003, Section 2.2.1

⁹ From discussion at meeting documented in note 1.

¹⁰ APTA with FTA support jointly funds work supporting the IEEE Rail Transit Vehicle Interface Standards Committee and the ASME Rail Standards Committee. This work is documented in Tom McGean, *Consensus Standards for the Rail Transit Industry*, Transit Cooperative Research Program Research Results Digest, November 2001, Number 44. APTA’s own industry rail transit standards work is documented by Tom Peacock in the report “Developing Safety and Operating Standards for Rail Transit” appearing in *TR News*, July-August 2001, pp 3-5. APTA commuter rail standards activities are documented in “Introduction to Joint APTA/FRA Passenger Rail Equipment Safety and Training”, a power point briefing available from the APTA web site www.apta.com. APTA bus activities are described in *Transit Cooperative Research Program Annual Report of Progress, 2003*, Transportation Research Board, p 24.

¹¹ *Standards-Setting and U.S. Competitiveness*, Hearing Before the Subcommittee on Environment, Technology and Standards, Committee on Science, House of Representatives, 107th Congress, June 28, 2001, Hearing Charter. Procedures for obtaining funding for development of voluntary product standards are in *Title 15 CFR Part 10*.

In making the policy decision with regard to what level of support is required, the importance of international standards should be considered from several perspectives. Major system suppliers such as Bombardier and Alstom are global organizations. While international standards are important to these groups, they have offices around the world and are already actively involved in IEC and ISO activities. The major advantage to this group of a more active U.S. presence would seem to be if it led to common standards for U.S. and non/U.S. products. For this to happen, the U.S. transit agencies have to be involved in the standards setting process. Otherwise, they will not be likely to use ISO/IEC standards in their procurements. If U.S. transit agencies do not participate in the international standards process and incorporate such standards into their procurement specifications, global suppliers may wind up making separate products for the U.S. market at added cost and expense. Transit agency involvement therefore stands to benefit both the transit agency and the global system supplier.

Another key player is the U.S. subsystem supplier. At the subsystem level, there is still a significant U.S. supplier base, but not all of these companies have the resources to support international standards. If they can not participate in the process, they could be effectively shut out, not only of the international transit marketplace but eventually even of the U.S. marketplace, to the extent that the large system suppliers move to IEC/ISO standards. Examples of subsystem suppliers who could suffer would be suppliers of communications protocols, brakes, doors, HVAC and similar subsystems. A persuasive case could perhaps be made for NIST support to enhance the international competitiveness of this critical transit subsystem supply industry.

EU Advantages in ISO/IEC Some U.S. based standards organizations have criticized the IEC/ISO system for having a non-level playing field which favors the EU trading bloc.¹² They note that agreements signed with the European Union facilitate the rapid adoption of EU standards by the ISO and IEC while U.S. standards face certain impediments. These include a disparity in voting power as well as standards marketing issues. The voting power disparity occurs because each nation is given one vote in ISO and IEC committees. As a result, the European Union has up to 25 votes, compared to only one for the United States, even though their gross domestic products are comparable.¹³ The marketing question is the result of differing approaches to funding standards in Europe and the United States. While EU standards efforts tend to be government funded, U.S. standards organizations obtain much of their funding through the sale of standards. As an example, in 1997 publication revenues made up 65% of

¹² See for example James Thomas, president of ASTM, "Plain Talk for a New Generation", *ASTM Standardization News*, August 2000; "Standards and Technical Barriers to Trade", *ASME Position Paper* released March 14, 1997; and "Industry, Standards, Government Leaders Call U.S. Standards Strategy Vital to U.S. Economic Growth, Global Competitiveness", *NIST Press Release*, Sept. 24, 1998.

¹³ For EU membership and Gross Domestic Product see *The World Almanac and Book of Facts 2004*, World Almanac Books, New York, 2004. EU data includes the ten nations scheduled to join in May 2004. EU GDP is \$10.352 trillion, U.S. GDP is \$10.4 trillion.

ANSI's total revenue.¹⁴ Making a U.S. standard an ISO or IEC standard can cut off this important source of funds to the U.S. standards group.¹⁵

APEC Participation The APEC standards activities now being supported by USDOT offer a promising counterweight to these real or perceived EU advantages. APEC members all border on the Pacific Ocean and include major economies such as the U.S., Japan, China, Korea, Southeast Asia, Russia and Canada. On the other hand, no EU nations border on the Pacific or belong to APEC. Thus EU and APEC membership are non-overlapping. Furthermore, APEC members have nearly three times the GDP of European Union nations.¹⁶ Thus APEC provides a credible forum for addressing standards issues of concern to the U.S.¹⁷

Industry Standards Organizations In addition to participation in ISO, IEC and APEC international standards activities, the transit industry should review whether involvement in certain critical international industry groups would be desirable. Given its key role in the area of internet standards, consideration should be given to some sort of effort to at least monitor and possibly participate in the activities of the Internet Engineering Task Force (IETF). This group is international, consensus-based, self funded and open to all interested participants at no charge. Another industry group where participation might be considered would be OASIS, a not-for-profit global consortium which is heavily involved with XML standards. XML standards represent a critical direction for standardization of data formats used in transit. Finally, the industry might consider greater involvement in the Lon Mark Interoperability Association, which is developing standards critical to the use of IEEE rail transit communications protocols.

IEEE Discussions Discussion between APTA and the IEEE is also recommended. This is needed to define the interface between APTA as IEC TC9 TA and IEEE as IEC TC9 TA/TAG Administrator. But there are also other potential areas where discussion could be worthwhile. As a traditional professional society consensus standards organization, IEEE took note when it saw all the major internet standards being developed by IETF outside of its Computer Society. Since then, IEEE has been a leader in pioneering the use of the internet to expedite the development of standards, including to conduct formal ballots. Beyond that, IEEE is actively seeking cooperative relationships with trade organizations interested in standards development, and has formed the IEEE Industry

¹⁴ Andrew Bank, "The Myth of Free Standards: Giving Away the Farm", award winning paper given at World Standards Day, 1998.

¹⁵ This issue may have discouraged the adoption of the ASCE *Automated People Mover Standard* by the IEC and led indirectly to the formation of IEC TC9 Working Group 39 to develop independent APM standards ASCE legal counsel refused to release copyright to this standard citing prior publishing agreements in Europe with another organization. See Telefax from Raymond Cordelier (IEC) to Tom McGean (ASCE) of July 26, 1997 and letter from James Rossberg (ASCE) to Raymond Cordelier of October 20, 1999.

¹⁶ APEC membership and GDP from *The World Almanac and Book of Facts – 2004*, op cit. APEC GDP is \$27.18 trillion.

¹⁷ By way of example, Alan Kieper has noted that Korea, Japan, the U.S., Canada and Australia typically provide the five country support needed to start a U.S. promoted standards effort in ISO TC204 WG8. It should be noted that all of these nations, which tend to vote together in Alan's Working Group, are APEC members.

Standards and Technology Organization (IEEE-ISTO) to offer industry groups increased choice and flexibility over that afforded by the traditional process.¹⁸ In the past, transit CEO's have been somewhat uncomfortable with the lack of control they have over the engineering society based standards process. It might be worth entering discussions with IEEE concerning this new facet of their standards activities.

Legal Issues and Actions In order to support the standards process, the following legal changes which are presently under consideration should be reviewed to determine whether they warrant support by the transit industry.

The *National Technology Transfer and Advancement Act of 1995 (Public Law 104-113)* requires all government agencies to use "standards that are developed or adopted by voluntary consensus standards bodies" as the basis for their federal regulations. The legislation and subsequent OMB clarifying directives leave it unclear whether industry standards organizations, as opposed to ANSI accredited standards bodies, would meet the criteria of a voluntary standards body. Under the *Standards Development Organization Advancement Act of 2003*, Congress has been considering explicitly recognizing industry consortia as legitimate standards developing organizations in the context of *Public Law 104-113*.¹⁹ This recognition would strengthen the legal standing of APTA industry standards in commuter rail, rail transit and the bus industry.

There is concern that a law passed in 1912 (*5 U.S.C. Section 5946*) may forbid the government from paying membership dues, travel costs or salary for its employees to participate in standards organizations that base their activities on individual membership. This would undermine government support in most consensus based standards organizations and thwart the intent of *Public Law 104-113* to encourage such participation. This area is currently under review in the House of Representatives Committee on Science, Subcommittee on Environment, Technology and Standards with the view to making it clear that government participation in standards activities is permissible.²⁰ In view of the importance of government employee participation to the standards process, it is recommended that the transit industry take a position supporting this proposed legislative change.²¹

The *National Cooperative Research and Production Act (NCHRA, 15 U.S.C., Section 430106)* as amended in 1993 provides that standards development organizations can limit their liability under the *Sherman Anti-trust Act* to actual, rather than treble damages by

¹⁸ IEEE Industry Standards and Technology Organization web page, <http://standards.ieee.org/industry/index.html> Downloaded Feb. 13, 2004.

¹⁹ Andrew Updegrove, "What Makes a 'Good' Standard Setting Organization 'Good'", *Consortium Standards Bulletin*, Lucash, Gesmer and Updegrove LLP, April 2003.

²⁰ Testimony by Oliver Smoot, Chairman of the Board ANSI, *Hearing Before the Subcommittee on Environment, Technology, and Standards, Committee on Science, House of Representatives*, 107th Congress, First Session, June 28, 2001

²¹ As a practical example of the problem, Volpe Center employees were advised not to participate in the ASME Rail Transit Standards Committee's activities developing structural and crash management standards by the Center's lawyers. This was unfortunate since their expertise would have been very helpful to this effort.

filing a notification with the Department of Justice.²² It should be determined whether APTA has filed this notification with regard to its standards activities and if not, it is suggested this filing be given serious consideration.

Summary of Recommendations

The above discussion can be summarized by positing three alternative paths for international transit standardization.

Hands Off Policy The first option would be to play no role in ISO/IEC or APEC activities and limit U.S. transit standards activities to an effort to achieve agreement between U.S. or possibly North American transit properties. Such an approach would seem to run counter to U.S. policies with regard to globalization and trade, would run counter to the *U.S. National Standards Strategy* developed jointly by government and the American National Standards Institute,²³ would possibly conflict with minister-level agreements made with APEC, and would conflict with USDOT funded intelligent transportation system initiatives now underway. Therefore such a policy is probably not viable.

Keeping Informed Policy As has been noted, it will require significant resources to actively participate in ISO and IEC activities. Both organizations are headquartered in Europe, and hold meetings worldwide. It is preferred that documents be prepared in both French and English.²⁴ Thus, a case can be made for limiting U.S. participation to what we have called “Keeping Informed”, while continuing to rely primarily upon ongoing APTA and engineering society standards activities.

This second “Keeping Informed” policy would not seek to take a lead or pro-active role in ISO/IEC activities, but would seek to keep the U.S. transit industry informed of critical developments, and positioned so that it can cast a ballot when deemed essential to its interests. To achieve this level of activity, the following actions should be considered:

- Consideration should be given to participation of APTA as a voting member in the ISO TC204 Technical Advisory Group

²² Testimony by James Shannon, President and CEO of the National Fire Protection Association, *Hearing Before the Task Force on Antitrust of the Committee on the Judiciary, House of Representatives*, 108th Congress, First Session, April 9, 2003 .

²³ *National Standards Strategy of the United States*, approved by ANSI Board August 31, 2000, ANSI. A full copy of this document is provided as Appendix C to this report.

²⁴ ISO/IEC policy is that “At the international level, it is common practice to use at least two languages”. The official languages are English, French, and Russian and in practice the two languages are usually English and French (see *Annex E, ISO/IEC Directives, Part 1*, “Procedures for the Technical Work”, 4th edition, 2001).

- The industry should consider asking the U.S. Secretariat of ISO TC204 to separate out emergency services from Working Group 8, so that there is a working group whose sole focus is transit ITS standards.
- Funding should be maintained at a level necessary to keep ISO TC204 Working Group 8 functioning properly.
- Operating procedures should be developed for the U.S. delegation to IEC TC9 and submitted for approval by ANSI.
- Discussions should be held between APTA and IEEE to determine the division of responsibilities between APTA as TC9 Technical Advisor and IEEE as TC9 TA/TAG Administrator in accord with the aforementioned operating procedures.
- Funding sources should be identified sufficient to support both the TA and TAG Administrator to permit them to 1) locate experts and delegates to attend TC9 meetings at their own expense, 2) distribute technical communications to interested parties, 3) develop an accurate U.S. consensus on ballot issues, and 4) see that U.S. ballots are submitted in a timely fashion.
- Consideration should be given to opening discussions with the IEEE with regard to a cooperative industry standards initiative combining engineering society and APTA sponsored standards activities through the IEEE-ISTO.
- Engineering society standards should be vigorously supported as potential international standards in their own right when they have de facto industry acceptance. Examples would be the *IEEE Communications Based Train Control Standard* and the *ASCE Automated People Mover Standard*.
- APEC participation should be continued at current levels.
- Consideration should be given to monitoring activities of the Internet Engineering Task Force.
- Discussions should be opened between APTA and the National Institute of Standards and Technology with regard to areas of cooperation and funding possibilities.
- An industry position should be established with regard to the pending *Standards Development Organization Advancement Act of 2003*, especially in the areas of the definition of a standards organization and permission of government employees to attend standards meetings.
- APTA registration with the Department of Justice as a standards development organization to limit Sherman Antitrust Act liability should be given serious consideration, if this has not yet been done.

This policy will require some additional funding to provide proper administrative support for TC9 and provide for increased APTA staff support for standards on the ISO 204 TAG and in other areas noted above. However, the added financial commitment should not be major.

Lead or Proactive Policy The third approach can be called “Taking a Lead Role”. Under this strategy, the United States would build on its lead role in ISO TC204 to play a pro-active part in ISO/IEC standards efforts. In addition to the

activities delineated for the “Keep Informed” policy, the following additional steps should be considered if the lead role approach is selected:

- APTA should consider sponsoring the ISO TC9 Working Group 8 advisory group thereby taking a lead responsibility for developing U.S. positions with regard to transit ITS standards.
- Funding should be obtained to permit attendance by transit agency personnel at both international and U.S. meetings of ISO and IEC committees so that the agencies have “ownership” and will use these standards in their procurements.
- Consideration should be given to folding APTA bus standards activities into the appropriate ISO standards committee.
- Funding should be provided so that a single individual can serve as the head of the U.S. TC9 delegation and regularly attend their meetings.
- Support for U.S. based VAN and TCIP standards as the basis for ISO standards should be made a priority after first securing a broad-based U.S. consensus and industry commitment.
- Support should be advanced for securing IEC adoption of the ASCE *Automated People Mover Standard*
- A strong participation in APEC should be considered with the goal of submitting unified APEC standards positions to ISO/IEC committees.
- Active involvement in the Internet Engineering Task Force, the Lon Mark Interoperability Association, and OASIS should be investigated.
- The transit industry should support and cooperate with higher level ANSI and NIST actions to address the voting and other imbalances which presently exist in the IEC and ISO.

Regardless of its value to the transit industry, this pro-active policy will not be successful and therefore should not be adopted, unless significant additional funding can be obtained to support the above steps in a meaningful way. This pro-active policy can not be entered into in a half-hearted way. A significant international travel budget is needed to permit travel by not only the head of the national delegation, but also by experts and transit agency staff to attend working group and full committee meetings. Lacking such support, the “Keeping Informed” policy is the responsible and realistic alternative.

History of International Standards Agreements and Organizations

Standards have existed since 7000 BC when cylindrical stones were used as units of weight in Egypt. One of the first known instances in the Western world occurred in 1120 when King Henry I of England ordered that the ell, the ancient yard, should be the exact length of his forearm, and should be standardized throughout his kingdom. In the United States, the first example is probably the standardizing of brick sizes in Boston in 1689, following a major fire. Arguably the most significant standard ever developed in the United States was that for the standard 4 foot 8 ½ inch railroad track gauge which made possible efficient interstate passenger and freight service. This standard remains in force to this day and is also used in Great Britain, Canada and much of continental Europe.²⁵

The following sections provide background on some of the major international agreements and understandings which govern international standards of interest to the transit industry.

International Electrotechnical Commission (IEC) The International Electrotechnical Commission is a voluntary, global organization that prepares and publishes international standards for all electrical, electronic and related technologies. The IEC was founded as a result of a resolution passed at the International Electrical Congress held in September 1904 in Saint Louis. It is not a formal government-to-government organization and is not governed by any treaties. Membership consists of more than 60 countries including all the world's major trading nations.²⁶ A key aspect of the IEC is that each member nation receives one vote.

The United States participates as a member nation in the IEC through the United States National Committee (USNC). The USNC was first formed in 1907 and merged with the American National Standards Institute (ANSI) in 1976. Today USNC is not an independent body but is a wholly integrated body of ANSI operating with its own procedures subject to ANSI approval.²⁷

International Organization for Standardization (ISO) The International Organization for Standardization is a network of national standards institutes from 148 countries. It was begun in 1926 as the International Federation of the National Standardizing Associations, focused heavily on mechanical engineering. It disbanded during World War II but was reorganized following the war at a meeting of delegates from 25 countries in London in 1946. ISO is a voluntary organization, was not formed by governmental or treaty agreements, and its members are not delegations of national governments. On the other hand, many (but not all) of its member institutes are either part of the governmental structure of their countries or are mandated by their government. ISO is thus a bridging

²⁵ From "The What, Why and How of Standards", www.techstreet.com/whystandards

²⁶ "Brief History: IEC-USNC-ANSI Chronology" ANSI Web site, www.ansi.org, Dec. 2, 2003 and "About the IEC", IEC web site www.iec.ch/ourwork/iecpub

²⁷ "Brief History: IEC-USNC-ANSI Chronology", op cit.

organization between the public and private sectors.²⁸ The ISO covers standards areas not within the province of the IEC. As with the IEC, each nation receives one vote regardless of its size or economic power.

The United States participates as a member nation in the ISO through the American National Standards Institute (ANSI). ANSI's stated goal is to enhance the global competitiveness of U.S. business and the American quality of life by promoting and facilitating voluntary consensus standards and ensuring their integrity. ANSI does not itself develop standards but oversees and guides the standards processes of other organizations. There are approximately 200 ANSI-accredited standards developers responsible for approximately 10,000 American National standards. In addition, as noted, ANSI also serves as the United States voting member of the ISO and as the umbrella organization for the USNC.²⁹

International Telecommunication Union (ITU) The International Telecommunication Union is an international treaty organization within which governments and the private sector co-ordinate global telecom networks and services. It was formed in response to the invention and rapid worldwide expansion of the telegraph. On May 17, 1865 the first International Telegraph Convention was signed in Paris by 20 nations, and the International Telegraph Union, forerunner of the present ITU, was formed to implement its provisions. This was followed by subsequent agreements governing wireless telegraphy, radio broadcasting and telephone service. In 1932 in Madrid the ITU adopted its present name to reflect the full scope of its responsibilities. After World War II on October 15, 1947, the ITU became a UN specialized agency and its headquarters were transferred from Bern, Switzerland to their present location in Geneva.³⁰ Unlike the ISO, IEC and most other standards organizations, the ITU is a government to government organization which establishes binding international conventions and regulations allocating frequency bands and addressing other issues related to international communications including television, satellites and cell phones. Every nation on the planet is a member of the ITU.³¹

The United States participates in the telecommunications aspects of the ITU through ANSI Committee T1 on telecommunications. This committee came into being with the realization that with the breakup of the Bell System de-facto U.S. standards for telecommunications could no longer be expected.

United Nations Economic Commission for Europe (UN/ECE) The United Nations Economic Commission for Europe includes European nations as well as Canada and the USA. UN/ECE was formed in 1947 to deal with the problems associated with the

²⁸ Cynthia J. Martineic, "A Brief History of ISO", www.sis.pitt.edu, downloaded December 2, 2003.

²⁹ *Standards Activities Overview*, ANSI web page, www.ansi.org/standards_activities/overview/overview.aspx?menuid=3, downloaded Dec. 2, 2003.

³⁰ "ITU Overview – History", *International Telecommunication Union* website, www.int/aboutitu/overview/history.html, downloaded Dec. 2, 2003 and *International Telecommunications Union*, *Encyclopedia Britannica, 15th ed.* Vol V, p 394.

³¹ *International Multimedia Telecommunications Consortium* web site, www.imtc.org/about/standards.asp, December 2, 2003.

reconstruction of Europe following World War II. UN/ECE views its present role as standards development and trade facilitation at the global level, trade policy recommendations at the regional level, and implementation of measures in UN/ECE member states. It is the parent of the UN Centre for Trade Facilitation and Electronic Business. UN/ECE has a *Memo of Understanding (MoU)* with the IEC, ISO and ITU to work together for interoperability on e-Business standards. Active areas for cooperation include XML standards, a uniform business language, e-catalogues and dictionaries, semantic registers, metadata registries, and bar-coding. ISO Technical Committee 204, Intelligent Transportation Systems, is an ISO committee active in transit standards which is involved with this MoU. The MoU was signed by IEC, ISO and UN/ECE in 1995 and by ITU on March 24, 2000.³²

World Intellectual Property Organization (WIPO) The World Intellectual Property Organization is a United Nations agency with headquarters in Geneva, Switzerland. WIPO is responsible for the promotion of the protection of intellectual property throughout the world and for the administration of various multilateral treaties dealing with legal and administrative aspects of intellectual property.

International Trade Treaties Impacting Standards The *General Agreement on Tariffs and Trade (GATT)* is an integrated set of bilateral trade agreements aimed at the abolition of quotas and the reduction of tariff duties among the contracting nations. It was first concluded by 23 nations in Geneva in 1947. Since then there have been a number of “rounds” of negotiations expanding the provisions and the number of nations involved.

The World Trade Organization (WTO), located in Geneva, was formed April 15, 1994 as part of the Uruguay Round of Multilateral Trade Negotiations under GATT.³³ WTO is the only international organization dealing with global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible. The WTO operates under agreements, negotiated and signed by governments of a large majority of the world’s trading nations and ratified in their parliaments. As of 1998 there were 132 member nations.

Of particular interest to this study is the *Agreement on Technical Barriers to Trade (TBT)*, sometimes known as the *Standards Code*. This code is Annex 3 of the WTO Agreement. It obliges WTO members to ensure that regulations, voluntary standards, and conformity assessment procedures do not create unnecessary obstacles to trade.³⁴ The WTO is responsible for seeing that central government standardizing bodies comply with a *Code of Good Practice for the Preparation, Adoption and Application of Standards* and take measures to see that local government and voluntary standardizing bodies do the same. Standardizing bodies which have accepted the code are to notify the ISO/IEC Information Centre in Geneva. In 1998 ANSI accepted the code on behalf of more than

³² “UNECE Strategic Action Plan for Trade Development, January 2003 to December 2003”, Trade Development and Timber Division, Trade Secretariat, September 2002.

³³ *Agreement Establishing the World Trade Organization*, April 15, 1994, Marrakesh, Uruguay.

³⁴ Deshpande, Sashe and Nazemetz, John, “Global Harmonization of Standards”, Oklahoma State University, Stillwater, Oklahoma, 1995.

200 standards developing organizations in the United States.³⁵ The *Standards Code* is provided as Appendix A of this report.

History and Background of Regional Agreements Affecting Transit Standards

In addition to these key international agreements, the situation is complicated by numerous other international and regional groups and agreements with regard to trade which vary from being quite limited in scope, to being quasi-sovereign. Examples include the European Union, the Commonwealth (formerly British Commonwealth), the Group of 8 (G-8), and the *North American Free Trade Agreement (NAFTA)*, as well as agreements among Caribbean, South American, Pan-American and African nations. There are far too many such groups/agreements to discuss all of them within the scope of this report without it becoming unnecessarily confusing to the reader. However, there are important regional agreements relating to Europe and Asia which have a direct impact on ongoing activities concerning international transit standards and which do require explanation.

The European Union (EU) The European Economic Community, predecessor to the current European Union was established by the Treaty of Rome in 1957. Since that time this initial trade agreement between six nations has grown to 15 full members and ten Eastern European nations which are scheduled to join in May 2004. In addition, some 70 nations in Africa, the Caribbean, and the Pacific are affiliated under the Lome Convention. The Maastricht treaty, signed by 12 continental western European nations in November 1993, established a common European currency, the “euro”.³⁶

Standards are set within the European Union by three major bodies. The European Telecommunications Standards Institute (ETSI), headquartered at Sophia, Antipolis, France, determines and produces telecommunications standards. It has 786 members representing over 56 nations.³⁷ Electrical and electronic standards are set by the European Committee for Electrotechnical Standardization (CENELEC), located in Brussels and founded as a non-profit organization under Belgian law in 1959.³⁸ All other standards are set by the European Committee for Standardization (CEN) which was formed in 1961 and is also located in Brussels.³⁹ CEN and CENELEC standards have greater status within the EU than is the case for the purely voluntary system used in the United States. Under Directive 98/34 of the European Parliament, CEN and CENELEC standards are normative for EU member nations and proposed national regulations which do not

³⁵ Willingmyre, George, “Approaches to influence the IPR policies and practices in US and Global standards setting”, GTW Associates, June 14, 2002, p12.

³⁶ *The World Almanac and Book of Facts, 2004*, World Almanac Books, New York, 2004, p858

³⁷ *International Multimedia Telecommunications Consortium*, web page www.imtc.org/about/standards.asp Downloaded Dec. 2, 2003.

³⁸ Deshpande, Sashe and Nazemetz, John, “Global Harmonization of Standards”, Oklahoma State University, Stillwater, Oklahoma, 1995.

³⁹ Ibid

conform can be challenged by any EU country In addition, Directive 93/98 requires that transit projects involving more than 400,000 euros use CEN or CENELEC standards.⁴⁰

The *Dresden* and *Vienna Agreements* are agreements made between the IEC and ISO and their standards setting counterparts in the European Union (EU). The *Dresden Agreement* is between the IEC and CENELEC⁴¹ while the *Vienna Agreement* is between the ISO and CEN.⁴² Both are cooperative arrangements to facilitate the transfer of European standards into international standards with either the international or the European group taking the lead in the standards development process. When CEN or CENELEC take the lead, the process is closed to any but European interests and ISO or IEC observers. Both the United States and Japan have objected to the preferential nature of these agreements as favoring the EU trading bloc.⁴³ Since CEN and CENELEC standards are effectively normative within the EU, this process extends de facto trade regulations of the EU into the international arena.

Asia-Pacific Economic Cooperation (APEC) The other key government to government regional trade organization which is of current importance to transit standards is Asia-Pacific Economic Cooperation. APEC was founded in November 1989 as a forum to further cooperation on trade and investment between nations which border on the Pacific Ocean and the rest of the world. Headquarters are in Singapore. APEC is open to Asian and Pacific Rim countries including countries such as Mexico, the United States, and Chile, which are in the Americas but border on the Pacific Ocean.⁴⁴ There is an APEC transportation group which is led by the U.S. APEC holds ministerial level meetings every 2-3 years which are attended by transportation ministers/secretaries. At their last meeting, the ministers directed APEC to promote standards. This will make standards a key focus of this group in the near future. Furthermore, the United States Department of Transportation is presently participating in APEC meetings.⁴⁵

⁴⁰ *Directive 98/34 of the European Parliament and of the Council Laying Down a Procedure for the Provision of Information in the Field of Technical Standards and Regulations and of Rules on Information Society Services*, July 20, 1998 and *Directive 93-38 Coordinating the Procurement Procedures of Entities Operating in Water, Energy, Transport and Telecommunications Sectors*, June 14, 1993. See also *General Guidelines for the Cooperation Between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association*, 2003/C 91/04, March 28, 2003.

⁴¹ "IEC-CENELEC Agreement on Common planning of new work and parallel voting", CLC(PERM)003, October 1996.

⁴² "Organization for Standardization (ISO) European Committee for Standardization (CEN) Guidelines for the implementation of the Agreement on technical cooperation between ISO and CEN (Vienna Agreement)" downloaded Dec. 2, 2003 from www.hido.or.jp/ITSHP_e/TS/p16.htm

⁴³ James Thomas, "Plain Talk for a New Generation", *ASTM Standardization News*, August 2000, p5.

⁴⁴ *The World Almanac and Book of Facts, 2004*, World Almanac Books, p858.

⁴⁵ Based on comments by Walter Kulyk of the Federal Transit Administration at the meeting documented in Note 1.

History and Background of Other Organizations involved in International Standards

In addition to the organizations and agreements cited above, there are a large number of organizations which have become involved in international standards in less formal or de facto ways.

Engineering Societies The role of engineering societies such as the Institute of Electrical and Electronics Engineers (IEEE), the American Society of Mechanical Engineers (ASME), the American Society of Testing Materials (ASTM) and the American Society of Civil Engineers (ASCE) with regard to international standards is somewhat unclear. All of these organizations admit members from any nation in the world and many of their published standards are internationally accepted and used. (Examples would be the ASME elevator code and boiler code as well as numerous IEEE computer and communications standards and, within the transit industry, the ASCE *Automated People Mover Standard*.) But these engineering society standards organizations do not operate within the formal aegis of the IEC or ISO, and in particular, do not follow the “one nation one vote rule” by which each member nation is entitled to one vote. Some of these organizations (ASME and ASTM for example) are actively asserting their role as international standards bodies and addressing what they perceive to be an ISO/IEC bias in favor of the European Union trading bloc.⁴⁶ Their concern is the added voting power the “one nation one vote” rule gives the many nations which belong to the European Union as compared with the United States, and also the special agreements the ISO and IEC have with EU standards setting organizations to facilitate the adoption of EU standards. The IEEE to date is taking a nuanced position calling itself an “international organization developing standards” as opposed to an “organization developing international standards” and remaining active in both the ISO/IEC as well as vigorously promoting its own international standards organization with globally oriented websites and other features. The current dominance of the United States and Asian nations in the computer and electronics fields serves to mitigate against any European bias within the IEC. On their side, the ISO and IEC oppose the international aspirations of the engineering societies and have notified the WTO Technical Barriers to Trade Review Committee (which reviews implementation of the agreement every three years) that international standards status should not be extended to any organization not respecting the “one nation one vote” principle.⁴⁷

Internet Industry Organizations and Consortia Industry organizations also play a role in international standards. This is especially true for the internet, where rapid change has favored informal and ad hoc standards setting methods. Because of the key role the

⁴⁶ See for example James Thomas, president of ASTM, “Plain Talk for a New Generation”, *ASTM Standardization News*, August 2000; “Standards and Technical Barriers to Trade”, *ASME Position Paper* released March 14, 1997; and “Industry, Standards, Government Leaders Call U.S. Standards Strategy Vital to U.S. Economic Growth, Global Competitiveness”, *NIST Press Release*, Sept. 24, 1998.

⁴⁷ Statement to the Technical Barriers to Trade (TBT) Committee by ISO Secretary General Dr. Lawrence D. Eicher

internet and internet derived protocols and data elements are expected to play in the future of mass transit systems, a discussion of this area is warranted. Prior to 1983, internet development was guided almost exclusively by the Department of Defense. In the mid 1980's, the Defense Advanced Research Projects Agency (DARPA) created a working group known as the Internet Engineering Task Force (IETF) to develop internet standards. Today IETF operates under the auspices of the Internet Society, a Reston, Virginia based non-profit international organization dedicated to the support and expansion of the internet. The IETF is international, consensus-based, self funded, and open to all interested participants at no charge. Its work is conducted primarily through internet mailing lists. There is no concept of membership and no participation fee is required. Three face-to-face meetings are held at locations around the world each year which typically attract more than 2000 persons.⁴⁸ The IETF keeps and maintains all of the original internet standards including TCP/IP, SMTP (electronic mail), FTP (file transfer), DNS (domain names), and telnet (remote login). Since 1986 it has developed hundreds of new standards including http, the transport protocol for the world-wide web and PPP, used for most dial-up internet access.⁴⁹

World Wide Web standards are developed principally by the World Wide Web Consortium (W3C). W3C was created in October, 1994 to develop common protocols that ensure web interoperability and accessibility by a wide range of devices which will eventually include cellular phones, TV, digital cameras and in-car computers. Its charter is to develop "interoperable technologies (specifications, guidelines, software and tools) to lead the Web to its full potential as a forum for information, commerce, communication and collective understanding." W3C is managed by three host institutions: the MIT Laboratory for Computer Science in the United States; the European Research Consortium in Informatics and Mathematics in France; and Keio University in Japan.⁵⁰

Neither IETF nor W3C are accredited by ANSI or part of the ISO/IEC system. However, in 1995, these organizations established liaisons with the ISO and the ITU.

Another example of an industry standards organization involved with the internet would be OASIS, the XML interoperability consortium. XML is the means for organizing web based communication. OASIS is a not-for-profit global consortium with more than 400 corporate and individual members in 100 nations around the world.⁵¹ OASIS and the

⁴⁸ Marcus Maher, "An Analysis of Internet Standardization", *Virginia Journal of Law and Technology*, Spring 1998, University of Virginia.

⁴⁹ IETF standards are developed by working groups. There are presently 129 working groups organized into nine technical areas. The IETF standards process is documented in RFC 2026 and requires rough consensus and technical operability. The latter objective requires that multiple actual and inter-operable implementations of a proposed standard must exist and be demonstrated before the proposal can be advanced along the standards track. A multi-stage appeals process is available.

⁵⁰ "About the World Wide Web Consortium" web page www.w3.org/Consortium, downloaded Jan. 2, 2003.

⁵¹ "Oasis Technical Work Overview", web page, www.oasis-open.org, downloaded Jan. 2, 2003.

United Nations jointly sponsor XML.org, a community clearinghouse on the web for XML application schemas, vocabularies and related documents. In February 2002, OASIS entered into a liaison relationship with the ISO and IEC to allow representatives from the three groups to participate in each others work.

Non-internet Industry Groups There are also industry groups which are involved directly in the development of transportation standards. This would include the Lon Mark Interoperability Association (LIA), a consortium which promotes the *Lon Works Communications Protocol (EAI 709.3-1998)*. This protocol has been adopted by the IEEE along with an IEC protocol as one of two complementary standards for use on transit vehicles. It is presently used on all new railcars for New York City Transit and New Jersey Transit.

Another major transit industry participant in standards is the American Public Transportation Association (APTA). In 1996, APTA instituted the *Passenger Rail Equipment Safety Standards (PRESS)* program to develop safety standards for our nation's commuter railroads.⁵² This was followed in 2001 by establishment of an industry/government funded effort to develop rail transit standards in the areas of vehicle inspection and maintenance, operating practices, fixed structures inspection and maintenance, grade crossings, and vehicle crashworthiness.⁵³ In addition to its own industry standards, the APTA program has assumed funding of a Transportation Cooperative Research Program (TCRP) initiative which established rail standards development organizations within the IEEE, ASME and American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).⁵⁴ APTA is also developing standards for transit buses under another TCRP program.⁵⁵ At the present time, none of these APTA efforts have a major international focus. However, an APTA representative has been appointed by ANSI as the United States Technical Advisor to IEC TC9, and the question of APTA's role vis-à-vis international transit standards is currently under review.

Summary of Key Federal Laws and Regulations Relating to Standards

Within the United States, there are a number of important laws and federal regulations which govern standards, and need to be understood by any organization contemplating involvement in the standards setting process. This section briefly discusses these various laws and regulations.

⁵² "Introduction to Joint APTA/FRA Passenger Rail Equipment Safety Training", power point briefing available on APTA website, www.apta.com

⁵³ Peacock, Tom, "Developing Safety and Operating Standards for Rail Transit", *TR News*, July-Aug 2001, pages 3-5.

⁵⁴ McGean, Tom, *Consensus Standards for the Rail Transit Industry*, Op cit. Note 10.

⁵⁵ *Transit Cooperative Research Program Annual Report of Progress, 2003*, Transportation Research Board, p24,

National Technology Transfer and Advancement Act The *National Technology Transfer and Advancement Act of 1995 (Public Law 104-113)* greatly enhanced the importance of consensus standards within the legal and regulatory structure of the United States. Section 12 of this legislation states that “...all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities.” In addition, federal agencies are required to consult with and, if possible, participate with voluntary, private-sector consensus standards organizations in developing technical standards.⁵⁶

This Act gives the force of law to previous Office of Management and Budget (OMB) directives encouraging government agencies to adopt private, voluntary standards and participate in their development. *OMB Circular A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities* was revised in 1998 to reflect the provisions of the act.⁵⁷ Circular A-119 requires agencies to use existing voluntary consensus standards in their regulatory activities unless those standards are inconsistent with applicable law or otherwise impractical.

There is current pressure on Congress to explicitly recognize consortia as legitimate standards developing organizations in the context of *Public Law 104-113*.⁵⁸ This may be of importance to APTA in that it would provide greater “legitimacy” to its PRESS standards vis-à-vis the FRA regulatory process.

There is concern that a law passed in 1912, (*5 U.S.C. Section 5946*) could undermine this Act by forbidding the U.S. government from paying membership dues, travel costs or salary for its employees to participate in standards organizations that base their activities on individual memberships. This area is presently under review in the House of Representatives Committee on Science, Subcommittee on Environment, Technology and Standards.⁵⁹

Other Acts Promoting Government Use of Standards The *Telecommunications Act of 1996* encourages the Federal Communications Commission to use privately developed standards that have been developed through an open and consensus-based process. The *Consumer Product Safety Act* requires the Consumer Product Safety Commission to rely on privately developed voluntary consensus consumer product safety standards.⁶⁰

⁵⁶ *National Technology Transfer and Advancement Act of 1995*, Public Law 104-113, 104th Congress, Section 12 (d) “Utilization of Consensus Technical Standards by Federal Agencies: Reports”.

⁵⁷ *Federal Participation in the Development and Use of Voluntary Standards*, Circular No. A-119, revised 1998, Office of Management and Budget.

⁵⁸ Testimony of Carl Cargill, Director of Standards, Sun Microsystems, *Hearing Before the Subcommittee of Environment, Technology and Standards, Committee on Science, House of Representatives*, 107th Congress, First Session, June 28, 2001.

⁵⁹ Testimony of Oliver Smoot, Chairman of the Board, ANSI, *ibid*.

⁶⁰ “Government Issues and Policy”, *ConsortiumInfo.Org*, Lucash, Gesmer and Updegrove LLP, www.consortiuminfo.org/government/ downloaded Dec. 2, 2003.

Volunteer Protection Act The *Volunteer Protection Act of 1997* exempts volunteers of nonprofit corporations (such as engineering societies) from civil liability for harm caused by an act or omission on behalf of the organization. To obtain this exemption, the volunteer must have been acting within the scope of his or her responsibilities and must have been properly licensed or otherwise authorized to perform the activity. In addition the harm must not have been caused by willful or criminal misconduct, gross negligence, reckless misconduct or flagrant indifference to the rights or safety of the individual harmed. This law provides significant added protection to professionals involved in standards activities.⁶¹

Department of Transportation Act The *Department of Transportation Act of 1966* (49 U.S.C. 103, Section 3(e)(1)) created the Federal Railroad Administration (FRA).⁶² Under this Act, one of the responsibilities of the FRA is to promulgate and enforce rail safety regulations. The Office of Safety regulates safety throughout the U.S. railroad industry. By law, the FRA mandate covers all mainline passenger and freight operations but does not include rail transit systems.

Transportation Efficiency Act for the 21st Century Section 5206 of the *Transportation Efficiency Act for the 21st Century (TEA-21)* requires that Intelligent Transportation System projects carried out with Highway Trust funds conform to the National ITS Architecture, applicable or provisional standards and protocols. This provides the force of law behind the use of standards for ITS systems receiving Federal funds.⁶³

Antitrust Law and Standards The basic federal antitrust law, the *Sherman Anti-trust Act*, was enacted in 1890 to regulate business activities in interstate commerce. Most of the substantive antitrust law that governs business today comes from analysis and applications of Sections 1 and 2 of the Sherman Act by the federal courts. The *Clayton Act of 1914* and the *Federal Trade Commission Act* (also passed in 1914) elaborate upon and extend some of the Sherman Act concepts and provide additional enforcement mechanisms. The Sherman Act in sweeping terms forbids every contract, combination, or conspiracy, in restraint of trade or commerce and also prohibits monopolization and attempts or conspiracies to monopolize trade.

Most importantly, violation of the Sherman Act is a crime, a felony, punishable upon conviction by a fine up to \$1 million for a corporation and up to \$100,000 for individuals and imprisonment for up to three years. Alternatively, or in addition to criminal prosecution, the Justice Department may attempt to punish a violator through civil injunctive relief including sale of part of a business. Furthermore, lawsuits may also be brought by anyone who alleges they have been damaged by anti-competitive acts and

⁶¹ “Clinton Signs Act to Protect Volunteers”, *Civil Engineering*, November 1977, page 96.

⁶² “About the FRA”, Federal Railroad Administration web page www.fra.dot.gov/Content2.asp?P=2 downloaded Jan. 2, 2004.

⁶³ “Transit Intelligent Transportation Systems National Architecture”, www.fta.gov/research/fleet/its/narch.htm , downloaded Jan. 2, 2004.

such actions, if successful, result in awards three times the amount of actual damages proved.

Societies and associations that bring together competitors in a spirit of cooperation have always been subject to close scrutiny under the anti-trust laws. Normally, scientific and technical organizations do not run as great a risk as do members of a trade association. Codes and standards writing and accreditation programs are completely legal. However standards, especially if used as the basis for government regulations, have enormous economic importance and can be used to limit competition. To avoid antitrust actions, standards processes need to be open, impartial and broadly based, and provide appeals procedures to safeguard minority rights.⁶⁴

Uncertainty with regard to application of the anti-trust laws to joint development endeavors such as standards setting led to the publication in 1980 by the Department of Justice of its “Antitrust Guidelines for Collaborations among Competitors”. In addition, the *National Cooperative Research and Production Act (NCHRP, 15 U.S.C. Section 430106)*, passed in 1993 was intended to provide immunity from antitrust sanctions but at present it is uncertain which, if any standard setting activities are currently entitled to that immunity. A new bill under review in Congress (the *Standards Development Organization Advancement Act of 2003*, H.R.1086) would explicitly extend the protection to standards development organizations. Meanwhile, under NCHRP, standards developing organizations can limit their liability to actual, rather than treble damages, by filing a notification with the Department of Justice.⁶⁵

Trade Agreements Act of 1979 and revisions of the Uruguay Round Agreements Act of 1994 incorporating the WTO TBT Agreement The formal text for implementation of the WTO Technical Barriers to Trade agreement in U.S. law is found at United States Code Title 19, Chapter 13, Subchapter 11, *Technical Barriers to Trade*.⁶⁶

Role of the National Institute of Standards and Technology in Standards

The National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS) was established by the *NBS Organic Act of 1901 (P.L. 56-177)*. The *Omnibus Trade and Competitiveness Act of 1988 (P.L. 100-418)* changed its name to NIST and explicitly charged the agency with providing technical services to facilitate the competitiveness of U.S. industry. Its mission includes developing and

⁶⁴ This section follows the discussion in “Laws, Cases and Regulation”, *ConsortiumInfo.org*, sponsored by Lucash, Gesmer and Updegrave, LLP, www.consortiuminfo.org/laws/ downloaded Jan. 2, 2004.

⁶⁵ *Hearing Before the Subcommittee on Environment, Technology and Standards, Committee of Science, House of Representatives*, 107th Congress, June 28, 2001.

⁶⁶ Willingmyre, George, Op cit. Note 35.

promoting measurements, standards, and technology to enhance productivity, facilitate trade, and improve quality of life.⁶⁷

NIST is a non-regulatory federal agency within the U.S. Commerce Department's Technology Administration. It is headquartered in Gaithersburg, Maryland and has another facility in Boulder, Colorado. NIST serves as the Department of Commerce contact point for investigation of non-tariff trade barriers (standards) for non-agricultural products under the *Agreement on Technical Barriers to Trade* of the WTO.

Plan for Implementation NIST was directed by *Public Law 104-113* to draw up a plan to implement key provisions of the law including requirements to coordinate standards among Federal state and local government agencies as well as among companies and groups in the private sector. The plan proposes a U.S. system for voluntary standards, product certification, accreditation of testing and calibration laboratories, registration of quality and environmental management systems and formal recognition of qualified private-sector standards bodies. The complete plan is provided as Appendix B of this report.

National Center for Standards and Certification Information The National Center for Standards and Certification Information (NCSCI) provides information on U.S., foreign and international voluntary standards, government regulations, and rules of conformity assessment for non-agricultural products. It is located within NIST in the Office of Standards Services.⁶⁸

National Standards Policy for the United States NIST and ANSI worked together to develop the *U.S. National Standards Strategy (NSS)*. This policy document, published in August 2000, is intended to serve as a roadmap to developing reliable, market-driven standards in all sectors. It was developed by a diverse group of government and private sector representatives from industry, government, trade and professional societies, and consumer organizations.

The document begins with a frank acknowledgment that the European Union is "...aggressively and successfully promoting its technology and practices to other nations around the world" through its national representation in the international standards activities of the ISO, IEC and ITU, and that these standards do not necessarily reflect U.S. needs or practices. It notes that this represents a significant detriment to U.S. competitiveness and can cause the U.S. to lose market share. The document reiterates those principles which have historically been the basis of U.S. voluntary standards activities; consensus, openness, balance, transparency, due process, flexibility, timeliness and coherence. It endorses the use of the IEC and ISO to develop international standards in some technology sectors, but not across the board, thus leaving room for engineering societies to play a role in international standards. The strategy strongly endorses the trend

⁶⁷ Schacht, Wendy, "The National Institute of Standards and Technology: An Overview", *CRS Report for Congress*, Order Code 95-30 SPR, Updated July 29, 2002, Congressional Research Service, the Library of Congress.

⁶⁸ "American Access to the European Standardization Process", ANSI, New York, c 1996, p4.

for government use of voluntary consensus standards in its regulatory processes. Internationally it specifically calls for review of the *Vienna and Dresden Agreements* and the “one nation, one vote” rule and calls for leadership in advancing U.S. principles and initiating changes where needed. The strategy calls for active international promotion of the U.S. decentralized standards process. Perhaps most important, it calls for establishing a stable funding mechanism for the standardization structure with government paying “...its fair share of the process costs not just as a major participant, but as the representative of a broader public interest.”⁶⁹ This policy document is provided as Appendix C to this report.

Current U.S. Participation on Key International Transit Standards Committees

Currently, the U.S. transit industry is participating in international standards activities in three areas. These are Technical Committee 9 of the IEC, Technical Committee 204 of the ISO and the Automated People Mover Standards Committee of the ASCE. The transit industry is also participating in ASME, IEEE, and American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) committees developing rail standards and has worked with the Society of Automotive Engineers (SAE), and the Institute of Transportation Engineers (ITE) on bus/ITS standards. All of these groups permit non-U.S. members and consider themselves international organizations. SAE and ITE standards are being internationalized through ISO TC204 and will be discussed in that context. For the most part, the other organizations do not appear to be actively promoting their transit standards internationally at present.

Some brief background is required to understand the functioning of ISO and IEC technical committees. ISO and IEC technical committees have two classes of members. “P” members are participants and have voting rights while “O” nations are only observers. On matters before the committee, each nation gets one vote (the “one nation one vote” rule). Each committee is led by one of the nation members which serves as the “secretariat” and appoints an individual to serve as the “secretary”. Another individual serves as the “chair” of the committee.

Technical Committees create Working Groups to implement specific standards activities. Each Working Group is led by a “Convener” from one of the nations. Working groups also have “rappateurs” whose responsibilities include coordinating meetings, contracting for experts, documenting meetings, and following through on action items. The relationships are illustrated by Figure 1 which shows illustrates the organization of ISO TC204, the Intelligent Transportation Systems Committee.

Each nation which is a member of the committee operates through its national delegation. ANSI/USNC procedures call for the U.S. voting position to be determined by

⁶⁹ *National Standards Strategy for the United States*, as approved by the ANSI Board on August 31, 2000, ANSI, New York

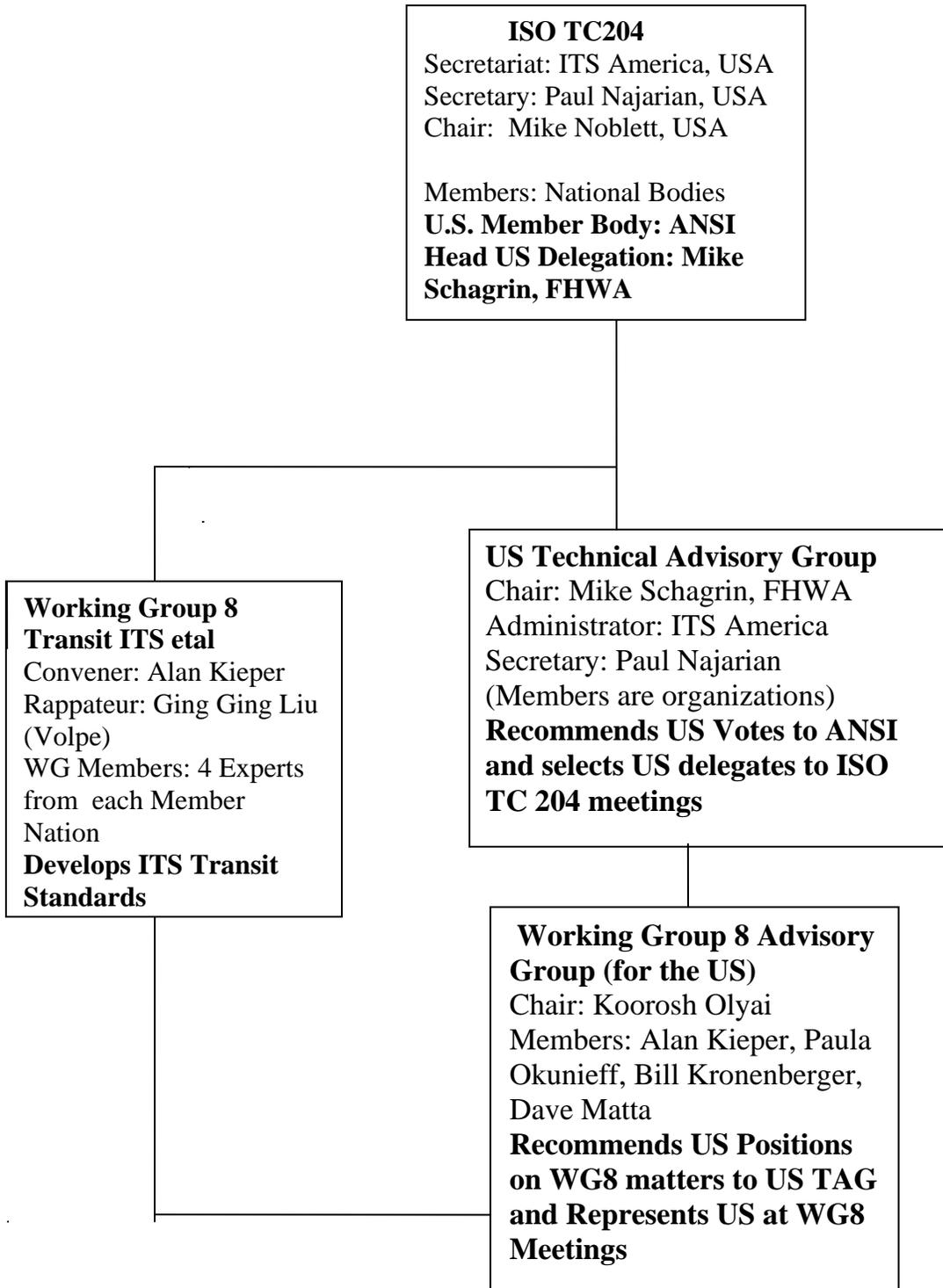


FIGURE 1: Flow Chart for ISO TC 204 Activity

a “Technical Advisory Group” (TAG). The organization of the TAG is slightly different in ANSI and the USNC. Under USNC procedures, considerable authority is vested in an individual designated as the “Technical Advisor”. The TA’s responsibilities include recommending the Technical Advisory Group (TAG) when it is first formed, guiding the TAG in selecting qualified delegates to Technical Committee meetings, arranging for distribution of applicable documents to TAG members and interested parties, collecting comments on documents, and forwarding TAG recommendations to the USNC regarding U.S. voting positions. In short, the TA runs the nation’s delegation. A USNC TAG must have at least three dues paying voting members.

Each USNC TAG is administered by a “TA/TAG Administrator”. The TA/TAG Administrator is normally a USNC member, either an organization, company or government agency. The administrator’s responsibilities vary for different committees but often include supporting the TA in organizing and maintaining the TAG, providing administrative services including document distribution, and in general supporting the TA in carrying out his/her responsibility.⁷⁰

ANSI procedures are slightly different in that they do not specify any responsibilities for a Technical Advisor as such. Responsibilities are assigned directly to the Technical Advisory Group or TAG, which is normally the body which develops national or U.S. standards in the particular area. The TAG normally has a chair, rather than a TA. The TAG determines U.S. voting positions and nominates U.S. technical experts to serve on ISO working groups. The TAG Administrator can either be ANSI itself or an external organization which is a member of ANSI. The authority of the TAG Administrator is considerable, with that body charged with organizing the U.S. TAG and transmitting U.S. voting positions to ANSI.⁷¹ These differences in organization, while not overly significant in themselves, can be quite confusing to someone involved with both ISO and IEC activities.

ISO Technical Committee 204 (ISO TC204) ISO Technical Committee 204, Intelligent Transportation Systems, is the international standards group which focuses on intelligent transportation systems (ITS). The committee’s scope is to standardize information, communication and control systems in the field of urban and rural transportation including intermodal and multimodal aspects. This includes traveler information, traffic management, public transport, commercial transport, emergency and security police services, and commercial services in the ITS field.

⁷⁰ *Operating Procedures For USNC/IEC Technical Advisory Groups (USNC/IEC Tags)*, approved by USNC Technical Management Committee by Letter Ballot 14, January 2002 and confirmed at the TMC Meeting on 17 January, Section 3.1 c).

⁷¹ *ANSI Procedures for U.S. Participation in the International Standards Activities of ISO*, January 2003 edition, issued May 1, 2003, Section 2.2.1 and *Operating Procedures, U.S. Technical Advisory Group to ISO/TC 204*, May 12 1999.

The organization is illustrated in Figure 1. The Secretariat is the United States through the Intelligent Transportation Society of America (ITS America) led by Paul Najarian. The Chair is Mike Noblett of the U.S.A.⁷² ITS also serves as the Technical Advisory Group Administrator for the U.S. The TAG is chaired by Mike Schagrin of the Federal Highway Administration; the Secretary is Paul Najarian. Membership in the TAG is by organizations rather than individuals. Any organization with a material interest in ITS may apply to join the TAG. Membership in ITS America is not a condition for joining but non members may be charged a fee.

Working Group 8, established in 1996 is the youngest working group in ISO TC204. It is responsible for emergency services and public transport standards. The U.S. leads the working group. Other member nations are the United Kingdom, Australia, Korea, Japan, France and Germany. Norway and Canada are presently inactive members. At this time, the public transport work is mainly associated with bus communications. The convener is Alan Kieper. WG8 has a Working Advisory Group (WAG) chaired by Koorosh Olyai and including Alan representing senior transit management, Paula Okunieff as the Transportation Communication Interface Profile (TCIP) expert, Bill Kronenberger as the Vehicle Area Network (VAN) expert, and Dave Matta as a general interest representative. The WAG is intended to formulate U.S. positions on WG8 projects and support U.S. positions at meetings. The Volpe Center serves as the Working Group 8 Secretariat, supported by a contract from the Federal Transit Administration. Gerry Flood is the Volpe program manager. Ging Ging Liu of the Volpe Center serves as the Working Group 8 rapporteur. The Volpe role is administrative with some technical and program oversight. Tasks include administration, communications and meeting arrangements. Volpe also manages the Working Group 8 work plan and facilitates joint/parallel development opportunities with external groups such as CEN.⁷³

Two areas being advanced by the United States in Working Group 8 are Vehicle Area Network (VAN) standards and Transportation Communication Interface Profile (TCIP) standards. VAN standards provide a standard communication profile to enable microprocessors on a vehicle to communicate with one another. TCIP standards provide standard conventions for specifying and defining the format and units of data being transmitted so that the information can be properly interpreted when it is received. The VAN effort on Working Group 8 has been spearheaded by Bill Kronenberger. Initially, the U.S. proposed the adoption of the SAE J 1708 protocol, widely used on U.S. vehicles. Western European nations pushed for a higher speed option and the time limit for adoption as an ISO standard expired before a consensus could be reached. A new work item was submitted in October of 2003 to be based on a higher speed SAE standard protocol now being developed (SAE J1939). ISO TC22, which is responsible for road vehicles, is reviewing the new work item to see whether it belongs under their aegis. SAE intellectual property rights must also be addressed. SAE J1939 is not scheduled for publication until 2005 and SAE copyright considerations make it difficult to provide

⁷² ISO TC 204, *Intelligent Transportation Systems*, Technical Committee Detail Page, ISO web site, www.iso.ch/iso/en/stdsdevelopment. Downloaded Dec. 9, 2003.

⁷³ Op cit, Note 1.

drafts for the proposed ISO standard over the internet. An additional concern is the lack of unified strong U.S. support behind this VAN standard.⁷⁴

TCIP is an acronym for USDOT funded ITS efforts to standardize the format and units of data being transmitted. The descriptions of TCIP data elements in these standards use ASN.1, a convention for documenting the format and units of data elements so they can be readily converted into other formats by data processing techniques. The U.S. effort to promote TCIP within Working Group 8 has been led by Paula Okunieff. ITS TCIP standards were formally submitted to TC204 for consideration as an ISO standard in October 1999. France and Germany voted no and proposed TRANSMODEL as a European alternative. Since then, the United Kingdom has been working on harmonizing the TCIP and TRANSMODEL data elements using XML language. Translation of ASN.1 TCIP data elements descriptions into XML has been performed independently by Ms. Okunieff and an APTA contractor and the two are now working to harmonize their respective efforts.

Other Relevant ISO Committees There are two other ISO committees working in areas of interest to transit. While the U.S. transit industry does not appear to be seriously participating in these committees at this time, U.S. suppliers and standards organizations are involved and they will be discussed for completeness.

ISO Technical Committee 22 (ISO TC 22), Road Vehicles, deals with standards for all types of road vehicles including trucks and buses. Membership on this committee includes vehicle manufacturers and government transportation agencies. The Secretariat of TC22 is AFNOR at the Bureau de Normalisation de l'automobile in France. Francoise Poveda is the Secretary and the Chair is presently vacant. The U.S. TAG Administrator is the Society of Automotive Engineers (SAE) led by Daniel D'Angelo. TC22 has five working groups and 25 subcommittees. The most relevant for transit vehicle design are Subcommittee 15, Interchangeability of Components of Commercial Vehicles and Buses and Subcommittee 13, Ergonomics. The SAE serves as the U.S. TAG Administrator for both subcommittees. Susan Haight leads the U.S. for SC 13 and Aleita Wilson for SC 15. At the present time SC 13 has twelve published standards and SC 15 has 38.⁷⁵

Also of interest is ISO Technical Committee 31 (ISO TC 31), Tyres, Rims and Valves. The Secretariat is held by ANSI for the United States. The Secretary is Sara DeSautels and the Chair is J.E. Rumel. Subcommittee SC4 deals with truck and bus tires and rims.⁷⁶

APEC Transit Standards Activity APEC has a transportation group which is presently led by the U.S. There are three subgroups in the transportation area. ITS expertise is located within the safety subgroup and is chaired by Walt Kulyk of FTA. This ITS group

⁷⁴ Ibid

⁷⁵ *ISO TC 22, Road Vehicles*, Technical Committee Detail Page, ISO web site, www.iso.ch/iso/en/stdsdevelopment. Downloaded Jan. 2, 2004.

⁷⁶ *ISO TC31, Tyres, Rims and Valves*, Technical Detail Page, ISO web site, www.iso.ch/iso/en/stdsdevelopment. Downloaded Jan. 2, 2004.

has identified transit standards as its number three priority. APEC has a liaison relationship with ISO TC 204. The transit group is to meet this April in Vancouver, B.C. to develop an APEC position to take to the ISO TC 204 Working Group 8, which deals with ITS for transit. APEC holds ministerial level meetings every 2-3 years which are attended by transportation ministers/secretaries. At their last meeting, the ministers directed APEC to promote standards. This will make standards a key focus of this group in the near future.⁷⁷

IEC Technical Committee 9 (IEC TC9) IEC Technical Committee 9, Electrical Equipment and Systems for Railways, is the key international standards group for rail standards. Its charter is to prepare international standards for the railway field including rolling stock, fixed installations, management systems for rail vehicle operation and the interfaces of these elements with their ecological environment. Included are mainline railways including passenger and freight, heavy rail transit, light rail transit, trolleybuses and automated transit systems. Scope is limited to electrical, electronic, and software as opposed to mechanical elements. The Secretariat is France through P.H. Desvignes as Secretary. Maurizio Cavagnaro of Italy is the Chair.⁷⁸ The U.S. delegation is currently led by Lou Sanders of the American Public Transportation Association as TA. The U.S. TA/TAG Administrator is the IEEE with the contact being Tricia Gerdon.

There are two critical working groups involved in rail transit. Working Group 39 is titled Railway Applications, Automated People Movers. It is convened by Anselme Cote of the RATP (Paris Metro). Its task is “On the basis of risk analysis with a systems approach, to prepare standards to cover the safety requirements for both existing transport systems and new systems, whatever their dimension.”⁷⁹ The U.S. delegate to this working group is Sam Lott, who was formerly the Vice Chair of the ASCE Automated People Mover Standards Committee.

Working Group 40 is titled Railway Applications – Urban Guided Transport Management and Command/Control Systems. Its convener is Daniel Coineau of the RATP (Paris Metro). It is tasked to use the most significant systems operating or being installed as a benchmark for a systems analysis to develop requirements relating to train control system function, safety and conformity assessment.⁸⁰ The U.S. delegate to this working group is Alan Rumsey who chairs the IEEE Rail Transit Vehicle Interface Standards Committee’s Working Group 2, Communications Based Signaling.

ASCE Automated People Mover Standards The ASCE Automated People Mover Standards Committee is a committee within the American Society of Civil Engineers formed in 1991 “to develop standards for automated people movers including planning, design, construction and operations...” The committee is chaired by Tom McGean. As with all engineering society based standards committees, there are no national

⁷⁷ Information provided by Walter Kulyk of Federal Transit Administration in meeting per Note 1.

⁷⁸ *Technical Committee No. 9, Electrical Equipment and Systems for Railways*, IEC web page, www.iec.ch, downloaded Dec. 4, 2003. Mr. Desvignes is retired from SNCF (French National Railways)

⁷⁹ From IEC web page for TC9, WG39, downloaded Dec. 4, 2003.

⁸⁰ from IEC 9/716/WG, TC9 WG40 Task Description

delegations. Any interested person may join the committee and each person has one vote. The committee has successfully balloted three standards “establishing the minimum set of requirements necessary to achieve an acceptable level of safety and performance for an APM system”⁸¹ and is now working on a fourth standard governing procedures and requirements necessary to make sure that an APM system remains safe and secure after it is built and put into operation. These standards have been used internationally but, as with all engineering society based standards, their claim to be international is “de facto” based on their use rather than through the ISO/IEC process.

Level of Participation and Support by Various Nations and Economic Blocs

This section investigates current participation in international transit standards activities on a national and regional trading bloc basis. Voting in ISO and IEC committees is on the basis of “one nation one vote” for participating or “P” nations and occurs at the committee, rather than the working group level. Therefore, we have evaluated the data at the committee level and considered only the “P” nations. It should be remembered that the actual standards drafting is done at the working group level so that participation at that level is essential to be a meaningful part of the standards effort.

ITS Participation First, ITS standards will be considered. There are a total of 22 voting members of ISO TC 204 of whom 9 belong to the EU, 8 to APEC and 2 to NAFTA. (Those nations scheduled to join the EU in 2004 have been considered to be members). Thus the voting power of the EU is 4.5 times that of NAFTA and roughly equal to that of APEC. By way of comparison, the gross domestic product of the EU and NAFTA is roughly equal, while APEC’s GDP is nearly three times that of the EU.⁸²

Rail Participation The major focus of the IEC TC9 committee is mainline passenger and freight rail service and rail transit. There are 26 “P” members on IEC TC9 of whom 15 are EU nations, 6 are APEC members, and 2 are NAFTA members. On a GDP basis, the EU has roughly 7 times the representation of either APEC or NAFTA⁸³

⁸¹ From the forward to *Automated People Mover Standards, Part 1*, ASCE 21-96, 1997.

⁸² Membership taken from ISO 204 web page. GDP from “Economic Statistics by Country, 2001”, www.infoplease.com Downloaded Dec. 9, 2003. Since TC 204 develops standards for ITS systems used for highway traffic, another way of comparing voting strength would be in proportion to the annual production of cars and trucks. On this basis, the EU gets seven times the voting representation as the U.S. and 2.4 times that of APEC.

⁸³ Membership taken from IEC TC9 web page. GDP from “Economic Statistics by Country, 2001”, www.infoplease.com Downloaded Dec. 9, 2003. Since this is a rail committee, the figures can also be analyzed in terms of ton miles of freight and passenger miles of rail and transit traffic. In terms of ton miles, the EU has eighty times the voting representation as the U.S. and thirty times the representation of APEC. On a passenger mile basis the EU voting power is 1.7 times the U.S. and nearly 7 times that of APEC.

Anachronistic Aspects of ISO and IEC The present European orientation of the ISO/IEC system would seem to be somewhat out of harmony with present day global economic realities. Considering the ISO as a whole, the organization has 94 voting members. European nations have 27% of these votes while the United States, Japan and China, the three largest economies in the world, together have 3%.⁸⁴

The location of both ISO and IEC headquarters are in Europe. In addition, the large number of European member nations leads inevitably to holding many of the meetings on that continent.⁸⁵ The special arrangements which exist with CEN and CENELEC increase the impact of this influence by encouraging the fast tracking of EU standards to ISO/IEC standards.

Another anachronistic feature of the ISO and IEC is that English, French and Russian are the official languages. While all administrative communications are now in English only, nearly all standards documents are still published in both French and English.⁸⁶ This choice of languages accommodates neither Japanese nor Chinese, the languages of the second and third largest economies in the world on a GDP basis.

Anachronistic Aspects of the Engineering Societies By contrast, engineering society standards committees have a bias in favor of the United States. These societies were originally U.S. organizations and most are ANSI members charged with establishing the U.S. position on ISO/IEC standards. As an example, we can consider the ASCE Automated People Mover Standards Committee, an engineering society standards organization which holds 2/3 of its meetings in the United States. The committee does not have membership by country, but by individual. Of the 59 members, 46 are Americans, two are from Canada, two are from Asia, and ten are from EU nations. NAFTA thus outvotes the EU on this committee by nearly five to one, while Asian representation is less than 5%.⁸⁷

This illustrates a key aspect of international standards today. The traditional IEC/ISO approach tends to be influenced by European trading interests, while the engineering societies are organizations originating in the U.S. which still tend to have an American bias.

⁸⁴ "ISO in Figures", ISO web page, www.iso.ch/iso/en/aboutiso/isoinfigures, Downloaded Jan. 16, 2004.

⁸⁵ Future meetings posted on the ISO website as of Feb. 11, 2004 distributed as follows: Europe 212, Asia 106, North America 77, and all others 32. From the IEC website for the same date the breakdown was Europe 10, Asia 9 and North America 2. Since its founding in 1904, 2/3 of the 70 general meetings of the IEC have been held in Europe. Of its 88 Technical Committees, 53 are presently led by EU nations vs. 13 by the US based on a visit to the IEC website April 15, 2004.

⁸⁶ The Gross Domestic Product of France is \$1.54 trillion U.S.; that of Russia is \$1.35 trillion. By comparison, China's GDP is \$5.7 trillion, Japan's \$3.55 trillion, Germany's \$2.184 trillion, and the English speaking countries of the United States, UK, and India alone nearly \$15 trillion. Today, French is the official language of two of the top 25 GDP countries (France and bi-lingual Canada – combined GDP \$2.5 trillion).

⁸⁷ "Automated People Movers Standards", Committee Datasheet, ASCE, October 8, 2003.

Funding of International Standards by Various Nations and Blocs

In the United States one national standards body (ANSI) accredits numerous standards development organizations. Funding is primarily private, from membership fees and sales of standards and publications. Unlike the United States approach, standards development in many other countries is undertaken with strong support from government. These governments are investing millions of dollars to promote acceptance of standards developed by their countries or trading blocs in the global marketplace. As an example, 41% of the 2002 budget for the CEN management center in 2002 was provided by the European Union and 51% from membership fees of member nations.⁸⁸ By way of comparison, in 2000 ANSI received a \$500,000 grant from NIST, equivalent to three percent of its annual budget. In Japan, Mexico, China and South Korea 100 per cent of standards organization funding is provided by the government.⁸⁹

The American Society of Association Executives (ASAE) is concerned about this imbalance. It has reported that from a competitive point of view, the U.S. government spends less to support international standards development than any other major trading nation. In addition, ASAE states that the U.S. is being outspent 10 to 1 by several major nations on technical assistance to develop the basic infrastructure necessary to create international standards in emerging markets and developing nations⁹⁰. Reflecting this concern, the Science Committee of the U.S. House of Representatives has been holding hearings on a more effective U.S. standardization strategy.⁹¹

Publication and Copyright Issues

The standards development process, even though relying heavily upon volunteers, still costs a good deal of money. Records must be maintained, ballots must be conducted, certification must be maintained, and standards must be kept up to date and periodically reaffirmed. Once a standard is developed, there are costs associated with publishing, printing and distribution. The internet culture, with its presumption that information should be free, threatens to undermine the economic underpinnings of standards, especially in the United States where the sale of standards documents provides the major source of revenue. The ease with which documents can be reproduced further undermines this approach to funding.

⁸⁸ "CEN Budget", CEN website, www.cenorm.be/cenorm/aboutus/information/budget/index.asp
Downloaded Dec. 31, 2003.

⁸⁹ "NIST Awards \$500,000 Grant to ANSI to Strengthen U.S. Participation in International Standardization", NIST Press Release, June 16, 2000.

⁹⁰ Purcell, Donald, "Global Standardization in the 21st Century" American Society of Association Executives", April 2000.

⁹¹ Ibid

At the present time, U.S. based engineering society standards development organizations rely almost entirely on membership fees and publication sales to support their activities. Some, such as the IEEE Standards Association, are reviewing this business model with a view towards relying more on industry and government grants. There is an interesting contrast between Europe and the United States. Within the U.S., ANSI receives 65% of its revenues from the sale of documents.⁹² Meantime, CEN, its European counterpart, is virtually completely funded by EU contributions and the contributions of national standardization bodies.⁹³ Ironically, the European Commission considers the CEN financing to be “structurally imbalanced” and recommends that “The revenue from sales of European standards should also become a source of financing...” and that “direct contributions by the parties concerned in the system should be considered.”⁹⁴ Thus it would appear that while U.S. SDO’s are moving towards the European model, the Europeans are considering moving toward the American model!

The future of publications as a reliable source of revenue will depend on resolution of the issue of copyright and intellectual property rights in the internet age.

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⁹² “The Myth of Free Standards: Giving Away the Farm” op cit.

⁹³ “The role of European standardisation in the framework of European legislation and policies,” Working Document Draft, November 2003, European Commission.

⁹⁴ Ibid

APPENDIX A

ANNEX 3 OF THE URUGUAY WTO AGREEMENT

CODE OF GOOD PRACTICE FOR THE PREPARATION

ADOPTION AND APPLICATION

OF STANDARDS

APPENDIX B
NIST PLAN FOR IMPLEMENTATION
OF PL 104-113

APPENDIX C
NATIONAL STANDARDS STRATEGY
FOR THE UNITED STATES

