TRADE CORRIDOR TRANSPARENCY AND SECURITY

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Summary

Corridor security can be achieved by combining transparency, identity verification, automated data gathering and real-time communications. Trade extends the chain of custody and transaction documentation across national boundaries. Broad access to commercial and government transaction records could occur using an international system of unique transaction numbers, i.e. an enhancement of the Unique Consignment Reference (UCR) already developed by the World Customs Organization.

This enhanced vision (UCR II) requires multinational agreement to adopt several new measures, including abandonment of multiple business identity numbers and their replacement across government record systems by the EAN*UCC Global Location Number (GLN) and expansion of the business registration process to include issue of corporate PKI signature packages and obligatory testing for a minimum number of the personnel from each business for their e-commerce skills and knowledge. All of this would be a condition of new or renewed business registrations.

UCR II, as a globally applied unique transaction number, would be composed of the GLNs of the seller and buyer plus a date/time stamp for the transaction. Once all commercial and trade files for a transaction are tagged in this way, national jurisdictions could assemble virtual files for risk assessment within a shared 24/7 secure communications network. No massive, centralized databases are envisaged. The proposed shared system, *for where-who-what* tracking of freight records, could give full supply chain visibility to each jurisdiction involved in the routing. The infrastructure used to monitor international movements could bring the same transparency to domestic movements.

The paper ends by identifying six parties in a position and with the capacity to become the champion of UCR II in the multinational discussions necessary to its adoption.

Introduction: Nature of the Trade System
Customs agencies manage the interface among the world's economies. The daily work environment comprises a diversity of transactions across trade routes and trading partners drawn from the G8 economies to the least developed. Policies, practices and work instruments must be robust and adaptive to function across the full range of these relationships.

Collaboration and harmonization are pursued through the 159-member World Customs Organization (WCO), under the constraint that each participating customs agency has a duty to administer according to its own national statutes and to protect the best interests of its home

economy. Harmonization is a constant objective. The Customs Data Model[1] – one such WCO initiative – seeks to simplify and standardize the electronic information needed by customs agencies to administer imports and exports in a paperless environment. Work on this project was begun in 1996 by the G7/8 customs agencies of the UK, USA, Canada, Japan, France, Germany and Italy. When completed, the initiative will give an all-electronic "single-window" to permit trading parties to file the minimum information required to obtain the customs release of goods entering another country. The WCO also envisages its Customs Data Model as a platform to enable customs-to-customs data exchanges. In September-October 2003, the Canadian and U.K. customs agencies implemented a G7/8 trial project that makes available paperless border clearance for freight movements that do not involve inspection or approval from any other government agencies. The project employs standardized data sets and electronic messages for its import, export, cargo reporting and accounting requirements. Among the anticipated savings is the ability for traders to re-use export reporting information to furnish substantial parts of the import reporting requirements of the receiving customs agency. This is a first opportunity to observe the workings of full paperless operations for significant movement volumes in a general traffic environment.

Except in crises, change of practices in the customs agency community tends to come in gradual, measured increments. Consultation must find not only sound and commonly agreed reasons for change, but also must proceed in ways and with timing that does not exceed the diverse capacities of WCO members to achieve the intended results.

Current paper-based supply chain and border management systems have high levels of data transfer 'friction' (delays and the introduction of errors during successive file transcriptions) and function largely as silos or disconnected islands of information. Even though professional communities of brokers, forwarders, express carriers, third party logistics providers and others offer 'bridging' and 'expediting' services between the islands, much of their work currently occurs inside proprietary black boxes that exclude the possibility of general sharing of original entry data with subsequently-involved parties located further along the supply chain. The view from the bridges is perhaps more extensive than the view from the islands, but fragmentation persists and produces numerous blind spots.

This fragmentation should not come as a surprise, when the complexity and the distant origins of the trade system and customs practices are considered. Each prominent commercial document, trade practice and customs procedure has emerged on a timeline spanning centuries to meet each era of changing needs and to build on the accumulated foundation of the global trading system. Journey times have shortened from months to days or hours. Communications have moved from periods of months required to deliver letter packets to near instantaneous 24/7 networks that deliver data packets. Systems for currency exchange, credit, security, signature, non-repudiation, quality control and numerous other transaction components have undergone generations of innovation, adaptation, expansion, electrification and automation.
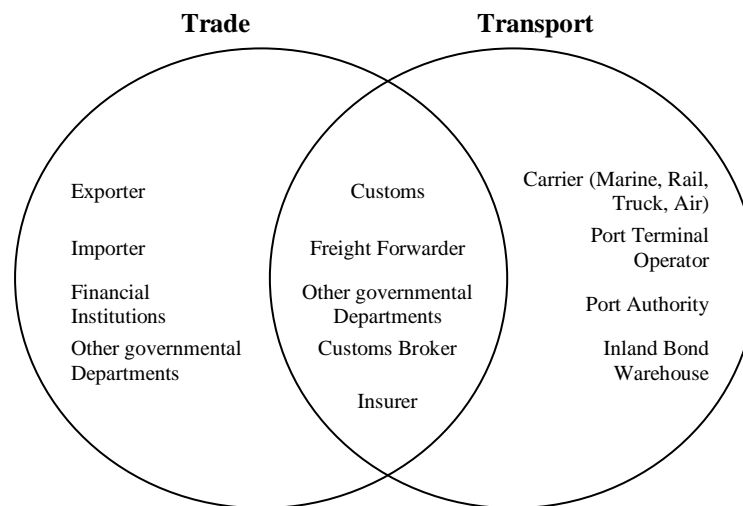
One U.S. expert[2] has described trading system dimensions in part as follows: *"A typical trade, in fact, may have as many as 20-25 involved parties – buyers, sellers, inland transporters on both sides of the ocean, ocean and other water carriers, middlemen, financiers, governments and others – and will generate 30-40 documents and some 200 different data elements… …In the US alone, there are an estimated 400,000 importing and exporting companies, 5,000 licensed forwarders and customs brokers, perhaps as many as 40,000 consolidators large and small, and*

millions engaged in the transportation industry. Worldwide, there are at least in theory some 500 ocean carriers – although probably 10-15 carry 90 percent of cargoes shipped between continents – an estimated 50-70,000 forwarders and tens of thousands more intermediaries, not to mention several million companies moving goods". Every economy has produced a bill of lading, for example, but to date no element of necessity has driven such instruments to have a common structure or identical uses – not between modes of transport and not between economies. Commercial documents and processes in some cases vary in form between individual enterprises. Customs documentation and processes – as already mentioned – must conform to respective national laws which have little uniformity and customs enforcement practices in 159 different domains are informed by these differences in national law and by other national interest considerations. There can be no expectation of natural synchronicity in all of this.

Bright spots of enlarged coherence do exist within the fabric of significant incoherence. Useful integration has been achieved in the current air delivery and express cargo systems because of practices such as customer-oriented track and trace services and extended use of air waybill numbers in the documentation generated among other related parties. Even here, continued use of multiple identities in other parts of the supply chain universe (for both the transaction and for the related parties) means that the overall result is anything but an open, transparent system.

The two circles in the above diagram indicate the differing domains of interest among the various parties involved in an international shipment. The terms and processes of trading – supplier, buyer, packing list, etc. –are intimately linked with terms from the world of transport – container, truckload, carrier, etc.; yet they call into play different information requirements, functions, goals and responsibilities. Often the same things or processes are referred to by different names in the two domains and incorporate varying levels of information detail. Some processes are of interest to both worlds – for example, both domains contribute information of critical importance to customs agencies. Other processes are exclusive to the sector and operations in one may not affect operations in the other.

Figure 1 TRADE VS. TRANSPORT[3]

Trade   **Transport**

Exporter

Importer

Financial Institutions

Other governmental Departments

Customs

Freight Forwarder

Other governmental Departments

Customs Broker

Insurer

Carrier (Marine, Rail, Truck, Air)

Port Terminal Operator

Port Authority

Inland Bond Warehouse

Carriers are not interested in the detailed product information on which the buyer and seller base their transaction. Carriers seek only information that directly affects their business – general identifying descriptions of the product and shipper, plus the factors that affect stowage and handling, i.e. how heavy, what dimensions, how much, where, to whom. As long as the goods arrive at the right time, at the right place and in good condition for that carrier's portion of the journey, it does not matter that they went to a consolidation warehouse, were transferred numerous times to different parties and carriers.

Customs, in its dual role of security risk assessor and excise and duty collector is interested in the buyer, seller and chain of custody aspects and also in the valuation, quantity and classification of the goods. Until recently, the information known to customs would be the last port of lading (or terminal of lading) of the goods, the current shipper, the carrier and the destination. Going forward, customs agencies are turning their attention to increasing levels of intelligence that support more sophisticated risks assessments and expand transparency across the entire supply chain.

Nature of the Security Challenge
All of this has significant implications for the current efforts to enhance transportation security, which must function in a globally interconnected web of services, yet eventually must resolve all potential blind spots.

In transportation, the frame of reference is a *transaction* – meaning that the location aspect of risk is a shifting continuum within a "*lane*" or a "*corridor*". Security in transportation must calculate the *where-who-what* equation in order to identify and manage overall risks. Each element must be known sufficiently to get the job done. Information gaps and delays lead to blind spots.

1. *Location:* What is the route? Where is the movement now and where is it headed?

2. *Identity (Persons):* Who is involved at each stage? Do they have a relevant history?

3. *Identity (Things):* What kinds of goods, assets and support systems are involved? What ones are parts of this transaction? Do they have a relevant history?

A forward-looking border management process will align the interests of commerce with those of security. Freightdesk Chairman & CEO Rob Quartel has called for a system of "virtual" entry profiles, based on contents, involved parties, financial information and all records of mode and path of transit. His proposals focus on international container flows, but the required information and business process infrastructure could serve equally well for the inland legs of cross-border shipments as well as to movements that occur entirely within domestic freight corridors of different economies. Temporary on-screen compilations of combined data sets, assembled "on the fly" from commercial documents together with government law enforcement and national security information, could create the overall profile that is subjected to various types of risk analysis at critical points of the journey. Shipments that span several economies will present varying risk profiles in each segment of the journey. Standstill periods, i.e. "*dwell times*", within a corridor will vary in number, duration and location and will alter potential risks, whether from intrusion, substitution, loss, accidents, theft, etc.

A multilateral system for risk evaluation could ensure for every shipment that each national jurisdiction could have the means to consider and act upon risks to its citizens, property and territory. Meeting this objective requires new means to monitor individual transportation movements as the journey unfolds in a world that currently has only limited capacity to provide such corridor transparency.

WCO Initiative – Unique Consignment Reference

One new data element – *the unique consignment reference*[4] (UCR) – was devised by the WCO in the late 1990s as a key feature under the Customs Data Model. It gives a traceable identifying number for an international movement of goods, both to monitor the movement during its life, and to audit the movement after it has been completed, i.e. "Like an electronic staple designed for e-commerce, a UCR binds information together, all the bits of data about a trade transaction, from initial order and consignment of goods by a supplier, to the movement of those goods and arrival at the border, through to their final delivery to the importer".

In the original development plan for UCR, the WCO proposed to test the two types of numbering systems; the first requiring common worldwide adoption of a new business practice and the second, combining an existing, nationally-applied corporate identifier for the shipper with a shipper-provided identifier for the goods:

1. *Globally Applied Unique Transaction Number:* This approach would have obliged all parties to an international goods movement to adopt a single, globally applied reference number in all parts of each transaction, so that the audit trail between all commercial and trade documents generated by any of the parties would reside in a common number applied to each document. Under this proposal, paper-based and automated processes required modification to make room for this new identifier, i.e. the classic formulation of short-term pain for long-term gain. Existence of a relationship between documents is easily verified by reference to a single data point, so information management under this structure is amenable both to relational database techniques and to the more Internet-friendly architecture associated with distributed processing.

2. *Relational Database Links:* The second approach obliges the seller of goods to generate a number for each international transaction containing an officially recognized national company identifier e.g. Customs, VAT, DUNS, EAN ID number, and an internally applied company reference to the goods covered by the transaction, e.g. purchase order, invoice number, etc. The resultant unique transaction number then is linked to other identifiers, i.e. broker /carrier commercial reference numbers, as additional parties join the original transaction. This growing table of relationships or joins between the various data files also must be preserved through any consignment splitting and consolidation for transportation purposes. The implied mechanism for accessing the audit trail back to the seller's universal reference is through relational database techniques.

    The attraction for buyers, sellers, inland transporters, ocean and other water carriers, middlemen and financiers is that the relational database permits the least disturbance on their business practices and legacy record systems. The downside is that this strategy masks the vast differences housed in the legacy structures within and between the 159 WCO jurisdictions that are responsible for processing more than 95 % of all international trade.

When a relational database is queried, the target data must first be traced and then returned through a series of record joins that define the relationship. With sufficient time and resources, it may be possible to construct and implement a relationship-crunching engine that is robust and agile enough to handle this diversity. Even so, it is inevitable that cases will arise – scattered unevenly through the present legacy structures – where some part of national record systems will not make the technical compatibility 'cut' in order for the relational database approach to work. Even if whole border management systems do not fall out during a conversion process, it is inevitable that a lack of technical compatibility or capacity will arbitrarily consign some industry sectors or companies to the sidelines until they can comply. These 'drop-outs' are unlikely to go quietly.

In the five years before September 11, 2001 (9/11), discussions with the trade exposed customs agencies to considerable 'push back' against the short-term pain proposition. It was considered a prohibitive expense with no early paybacks to demand that the paper-based and automated systems maintained by different parts of the world trade system be modified to add a new transaction identification number. By June 1999, the relational database approach and its minimal disturbance of legacy systems emerged from the review process as the preferred approach. No timetable emerged, however, by which the Customs Data Model or the relational database version of the UCR was to become a standard component of the global customs clearance apparatus.

WCO Gradualist Strategy
Even with the dramatic changes to world trade practices already put in motion since 9/11, the WCO is yet to adopt a firm timetable for mandatory changes. Early in 2003, the WCO enunciated a gradualist strategy of *guidelines for co-operative arrangements between Customs agencies and private industry*, which WCO documentation[5] summarizes as follows:

1. *Use of the "Authorised Trader[6]" concept within the supply chain;*
2. *Use of the Unique Consignment Reference (UCR);*
3. Provision of security for the entire supply chain, including authorised trader premises;
4. *Expansion of information and intelligence sources and capabilities, including the earlier collection and provision of information and intelligence gathered from all possible sources;*
5. Reliance on voluntary co-operation with the international business community, retaining the option for legislation and mandatory procedures, and mutual recognition of the secure assurance procedures in other countries; and
6. Building on the existing initiatives such as BASC[7] and C-TPAT.

### U.S. Security Imperatives And Their Costs
Against this WCO gradualist strategy, the circle of affected parties continues to expand under the U.S. post-9/11 border management protocols, e.g. the Container Security Initiative (CSI), the Customs-Trade Partnership Against Terrorism (C-TPAT) and Free And Secure Trade (FAST). Some of these measures are said by the U.S. to be 'voluntary', but only in the sense that businesses from other economies must comply with these demands if they wish to continue trade with the U.S. under the best available terms.

Pushing U.S. borders outward under these programs requires a 'voluntary' worldwide re-engineering of business processes, the installation of a significant subset of available paperless trading capabilities and major public and private expenditures by foreign parties. In a July 2003 report entitled Security *In Maritime Transport: Risk Factors And Economic Impact[8]* the OECD Maritime Transport Committee places worldwide costs in excess of $60 billion (US) for any marine system shutdown in response to a coordinated terrorist attack. Against this risk, the report estimates global maritime sector costs of current system changes at $1.3 billion in the first year, with recurring annual costs of about $700 million. In addition to the costs imposed by the U.S. programs already cited, the OECD report covers a new package security measures that are now mandatory on all signatories of the Safety of Life at Sea (SOLAS) Convention – amended by a new Chapter X1-2 that solely addresses ship security – and by a new, 2-part, International Ship and Port Facility Security Code (ISPS) Code.

The layered nature of the voluntary and mandatory strategies is portrayed in the report as follows:

Figure 2 International Container Logistics Chain Vulnerability Assessment
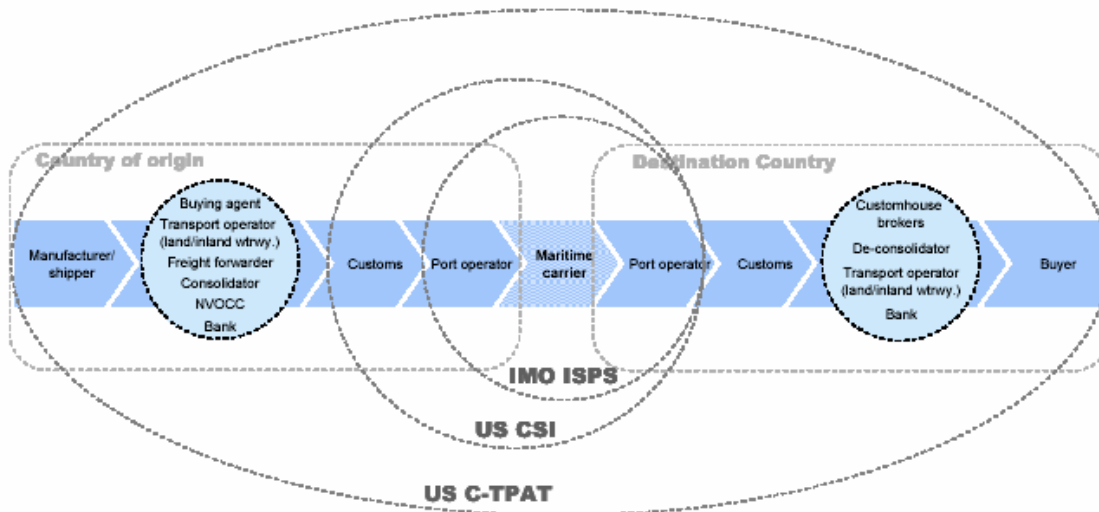
The OECD report also contains a reminder that *"many of the measures proposed have distinct benefits that are not related to their anti-terrorism task. These benefits result from reduced delays, faster processing times, better asset control, decreased payroll (due to IT improvements), fewer losses due to theft, decreased insurance costs, etc. These savings can be significant, and can serve to counter-balance the increase in security costs"*

The magnitude and swiftness of this portfolio of measures demonstrate that the WCO gradualism strategy is seriously out of step with the 'comply-or-wait' world now being driven by unilateral U.S. security policy choices. Neither can it be imagined that the list of eventual changes is fully formed – whether in the marine world or in other parts of the global trading system. As reviews and audits reveal further blind spots in end-to-end logistics chains, U.S. authorities will enlarge their demands until a minimum acceptable version of trade corridor transparency is reached.

Doing less only jeopardizes the large re-engineering investments already completed or authorized and U.S. authorities are unlikely to opt for a security framework that figuratively sends astronauts only halfway to the moon.

The communities of trade practitioners who pushed aside the UCR option of a *globally applied unique transaction number* wanted to minimize disturbance to their legacy investments. The same parties are now scrambling to design, finance and deploy far more demanding changes to their operations and records systems. Parties who operate in trade lanes into and out of the U.S. now must move to meet the paperless communications requirements demanded by the U.S. Bureau of Customs & Border Protection (CBP) and other U.S. agencies. The trade must either begin continuous conversion of legacy data through specialists in data capture and manipulation services or abandon paper-based legacy systems to automated replacements. This short-term pain is evolving with extraordinary rapidity, with a minimum of consultation and with real risks of inadequate design standards for the long-term, which, like the Y2K shortcut, may require costly downstream rationalization and repair.

Nothing in these worldwide changes is intended to overcome cobbled-together nature of the relational database model now being pursued under the UCR initiative. Holding to the priority of legacy systems over the adoption of a standards-based response only encourages continued evolution of legacy systems along divergent tracks. A relational database strategy – while it remains at a local or national scale – may be able to mask current incompatibilities among the multiplicity of underlying structures and practices. And a voluntary approach to implementation can forestall any early confrontations over global incompatibilities or non-compliance. Until these strategic issues are resolved, they will only expand the level of systemic risks in the global trade apparatus and maintain blind spots within transactional chains of custody that may one day be exploited by parties with malicious intent.

The durability and scalability of the central junction box of a future paperless system has to be considered against the background of the daily volumes of trade and transportation shipments, the evolution of corporate inventory and just-in-time practices and the changing requirements in real-time track and trace capabilities. These practices imply high volumes of repeated ID, location and shipment condition queries. The daily number of hits, queries and new transactions will continue to grow. This is a major pressure vector, where the target, recipient and contents of every message must parsed repeatedly by a single, centralized relationship-crunching engine. Another disconnect vector will emerge as vendor capture further accentuates the black box differences between legacy systems, during the migration from paper transactions to the paperless capabilities that will be required under each new U.S. specification of its security requirements for trade.

The UCR relational database model is likely to fracture then break under the stresses of these and other centripetal vectors, together with the expediencies encouraged under the rapid implementation demanded by U.S. policies. Failure of the customs clearance system of one economy has the same consequences as the disruptions of a terrorist event or work stoppages due to a strike, i.e. it severs the connections between a particular economy and the rest of the world trading system. Should the failure occur in a poorly designed or under built central junction box, the impacts are far more widespread, the repair could not happen quickly and the investments-to-date by all parties are placed in equal jeopardy.

Timely To Consider Altering Course – UCR II
There is another important change factor since the UCR design began to move along its current path. Considerable work on globally unique numbering systems has now been done in the private sector. Work by the EAN*UCC offers a prominent example. These two organizations began as separate industry councils devoted to industry standardization and best practices and are best known as the global managers of the international barcode system. EAN*UCC is pursuing voluntary industry adoption of multiple, mutually supporting numbering and identity systems, i.e. for goods, locations, corporations, handling equipment, containment systems and transport vehicles. One of these is the *global location number* (GLN)[9], which offers unambiguous and efficient identification around the world of corporations and their operating locations.

At the very least, the alternative vision of the UCR under a *globally applied unique transaction number* needs to be revisited to ask whether it offers a better path to follow in today's greatly changed circumstances.

This document supports the idea that a modified UCR (UCR II) should be embraced in order to take full advantage of convergence now occurring between the Internet, goods tracking and E-commerce environments.

There are five pillars of change that could usefully appear in the UCR II vision.

1. A *globally applied unique transaction number ideally* applied in all domestic and international business-to-business transactions (B2B).

2. International conversion and augmentation of business registration processes to include three features
   (a) abandonment of multiple business identity numbers and their replacement across government record systems by the EAN*UCC Global Location Number (GLN);

   (b) new and existing business entities receive an appropriate PKI authentication toolkit as part of their initial registration or renewal, with renewal cycles temporarily shortened as part of a transition period; and

   (c) obligatory testing for a minimum number of the personnel from each business for their e-commerce skills and knowledge (GLNs, PKI and related skills) as a condition of new or renewed business registrations. This would compare to the skill and knowledge testing in driver licensing.

3. Establishing transaction uniqueness from a UCR II composed of the GLNs of the seller and buyer plus a date/time stamp for the transaction.

4. Giving the UCR II identifier a special Internet "presence", i.e. a cross between an always-on IP address and the "presence awareness" features of instant messaging addresses.

5. Cooperative installation of an international secure "spine" network to contain the communications that locate – and can examine inside a virtual file – all messages and other commercial documents that bear a common UCR II transaction identifier, i.e. the Internet of commercial and trade documentation.

UCR II imagines that it would be possible to secure cooperation among governments who form a sufficient critical mass so that these measures in due course could become global. It imagines that participating governments and private holders of key intellectual properties could find the basis for the necessary private-public partnerships. The goal imagines that billions in private and public investments could be agreed and coordinated in a comparatively short time period. It imagines that U.S. unilateral requirements for heightened security could merge successfully with a multilateral re-engineering of business processes intended in part to satisfy other public and private objectives. And finally, the UCR II vision imagines that public and private participants could devise, reach international agreement on and deploy the layered and nested set of communications, security and accountability protocols required for a secure "spine" network.

The first inclination will be to label this UCR II vision as an impossible fantasy. Yet is this really the case? How much is already under way or will have to be launched in any case in response commercial need and to U.S. imperatives? The UCR II vision contains some elements of invention and transformation, but mainly it provides a holistic insight that integrates and harmonizes the energies of current re-engineering and investment decisions – a proverbial joining of the dots already present in the environment. The 11 factors reviewed below indicate that substantial portions of the 5 pillars for UCR II already exist or are coming into being.

1. *Corporate identity:* Current governmental practice within national public record systems is to assign multiple identifiers to any resident corporation. Multiple corporate pseudonyms are anathema to the good operation of automated, instantaneous, global transaction systems, i.e. the much forecast but yet-to-emerge e-commerce world. Such ambiguity is significantly out of step in an environment that is moving rapidly toward unique identifiers on all manufactured items (to create an Internet of things) and demands that the uniqueness and risk factors of personal identities be supported by regular criminal background checks, substance abuse tests and by photographs, fingerprints and other biometric markers. Unlike C-TPAT, CSI and FAST, unification of corporate identities would place the same 'burden of change' on the US government and US companies as is now imposed on the rest of the world.

2. *Resources:* The decisions of BCP, a single US agency, to meet comparatively narrow goals have triggered a first round of re-engineering costs in the global trade system that is likely to exceed $10-$12 billion over the next decade. Further BCP demands are likely to involve a comparable global sum of that size in the same decade, i.e. an aggregate of perhaps $20 billion – once these are defined, particularly in regard to truck mode communications/tracking capacities and for verifiable worker identification and history checks along entire domestic and international chains of custody. Changes on this scale need careful discussion among the affected parties to verify that the right outcomes are being purchased.

3. *Technological expediency:* The Y2K problem underscored how expense and disruption to clean up once technological expediency imposes limited vision and fails to consider the long-run consequences of global scale and integration. Similarly, various contagion problems (BSE, SARS, West Nile virus, etc.) also are demonstrating that technologically furnished global information has an important role in modern societies outside the management of terrorist risks.

4.   *Skills and knowledge testing:* Drivers, pilots, mariners, locomotive engineers, stationary engineers, lab technicians, doctors, nurses, lawyers, dentists and many others are challenged to demonstrate basic knowledge and competencies before they are permitted to pursue complex activities, where lack of due care and competence might inflict great harm on individuals or the public at large. Business entities by their policies and practices already demonstrate large capacities to inflict harm (thalidomide, Tylenol, tobacco, BSE, Enron, etc.). At a more basic level, however, the e-commerce world can only emerge when the public and business partners can be confident that business representatives whom they encounter have the capability to consistently execute secure, competent transactions. Allowing entry by untutored amateurs and sourcing skills primarily through on-the-job training is a dubious approach this confidence building. More is required.

5.   *Distributed processing:* The *globally applied unique transaction number* enables transformation from a paper-based 'push' system for inspection of a fully assembled paper file at the physical border to a distributed architecture, Internet-based 'pull' system, i.e. one where processes are designed to pull the original entries of critical transaction information to each place and time where they are needed to continue the movement of goods within the supply chain. This design captures the redundancy, resilience and scalability features normally present in such distributed architectures. Bearing the short-term pain to establish this capacity will locate border clearance decisions in the first real-time, end-to-end view of trade-based supply chains.

6.   *Corridor transparency:* The infrastructure and business processes needed for border management will enable domestic corridors of supply chains to have the same level of transparency. It becomes practical under this model to move the security system from a strategy of an 'enlarged perimeter' to a strategy of corridor transparency and to have universal tracking from the factory door to the final customer. UCR II would merge with and be greatly strengthened by the 'Internet of things' now starting to be deployed through RFID[10] tagging and real-time location reporting systems for manufacturing and retail

7.   *Private-public partnerships:* Governments generally have a strong aversion to entering technical areas in a manner that could disrupt competitive supply – even where government has an evident role as a model user. Private-public partnership (PPP) may be the only viable institutional setting to permit government activism. Public authority under its business-numbering role is in a position in a brief time to move GLNs and PKIs from low market acceptance to a universal element of B2B sector transactions. Negotiation of global PPPs for the assignment of GLNs and PKIs as part of business registration also could require or award points for a "developing countries special measures package" and/or an "SME special measures package". The enabling mechanisms of electronic commerce, e.g. GLNs, PKIs, secure channels and so forth, appear to be trapped at low points of the acceptance curve[11] for new technologies These are areas where investment uncertainty is likely to remain prohibitively high unless the public and private sectors move forward in unison. Without a PPP initiative it is unclear when and how a move to broad acceptance will be reached.

8. *Internet business model:* Once platforms like GLN and PKI are in place, the private sector can be expected to make steady progress in marketing 'stack on' value through existing products and through new innovations. The supplier incentive to 'give away' GLNs or PKI signature toolkits is to gain an edge in critical distribution channels.[12] This was evident during the 'browser wars' period of early Internet development and in the business model for the satellite-based GPS system, where commercial value-added services are now stacked on top of the 'free' public signal.

9. *Sovereignty:* UCR II enables access by any participating government – should they wish it – to the same risk factor profiles as will be available to US authorities. This gives a genuine aspect of mutual defence against terrorist acts. The UCR II vision also incorporates a broad distribution of similar burdens of limited duration, will generate substantial offsetting benefits for the parties in other areas of their business that are not trade- and customs-related and avoids the fact or appearance of unreasonable advantages flowing largely from asymmetrical power relationships. The perception of threats to sovereignty also should be reduced in a setting where pain is to be shared by all.

10. *Standards:* Six international standards organizations have work under way in multiple domains[13] related to transportation logistics, communications, security, border management and electronic commerce: the World Customs Organization, the International Electrotechnical Commission, the International Standards Organization, the United Nations Economic Commission for Europe, the International Telecommunications Union and the International Maritime Organization. In order to mitigate the potential for overlap and conflict among these many related work domains there are multiple MOU arrangements and steering committee machinery maintain coordination toward common goals. The UCR II vision depends on coordinated international action and these standards organizations furnish an immense reservoir knowledge, expertise and good will on which the parties may draw.

11. *Spine network:* In the UCR II vision, the spine provides the global communications environment for a new Internet of commercial and trade documentation. The scope of the proposed spine facility is illustrated below. Using a distributed processing architecture, the "spine" would provide border management and security authorities of participating economies with dynamic access to every supply chain at any stage of transaction completion and permit on-the-fly merger of this intelligence with relevant information from government files in order to do comprehensive risk analysis. Direct accountability for the quality, timeliness and authentication of data inputs will fall on each participating supplier for their own inputs, rather a consolidation by one or two overburdened parties before the file is submitted to public authorities.

RISK ASSESSMENT

- *Where-who-what* equation is determined sufficiently to manage overall risks.

Figure 3 UCR II Adapted to the Internet & E-Commerence Enviroment

UCR II - Adapted to the Internet and E-commerce Environment
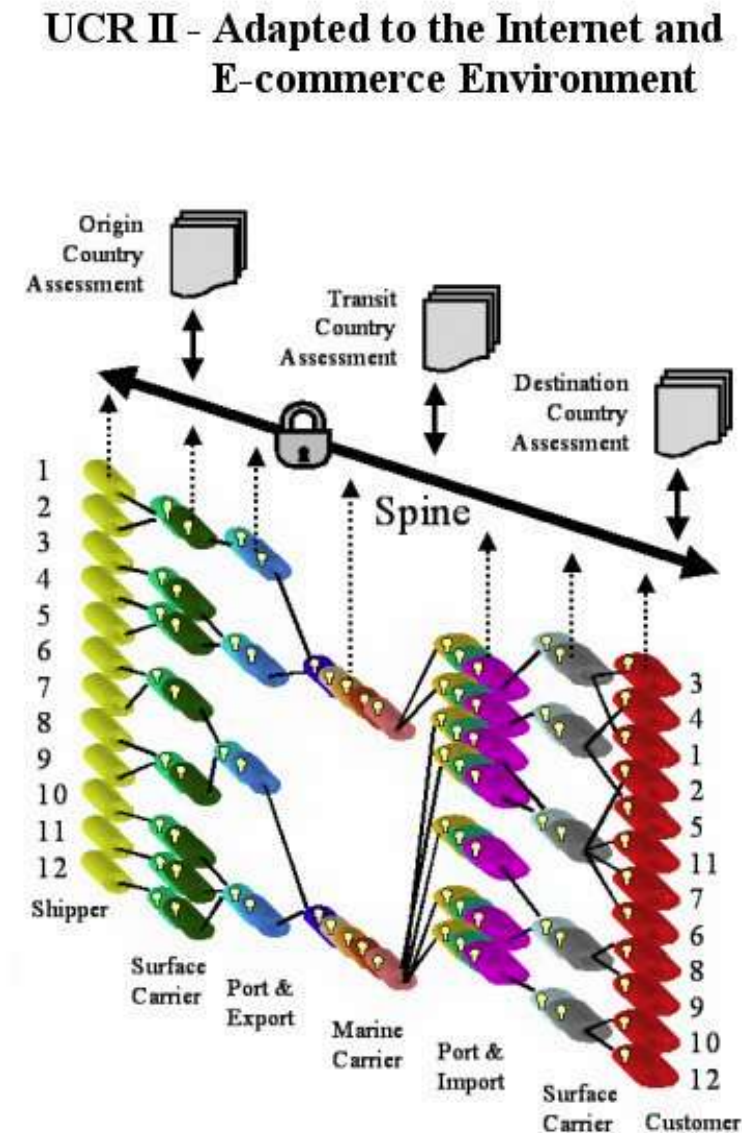
IDENTITY*/ROUTE*

- Unique, encrypted tag (UCR II) assigned to each movement and affixed to each "profile" record developed by any party at any stage of the transaction.
- Functions like a transponder or an IP address for each primary buy-sell transaction.
- UCR II ID also affixed to all other supply chain records that bring in subcontracts under the primary buy-sell transaction.
- UCR II switched to "inactive" on these records once the trip is completed, but these inactive "histories" can be accessed via data mining across the spine as part of the where-who-what risk assessment for a new active trip.

NOTICE

- Notice of the route and the UCR II number sent to each jurisdiction included in the route.

SPINE/UCR II

- Parties maintain secure 24/7 access to UCR II records.
- Record system integrity regularly verified through new ISO standard for security practices.

Finding A Champion
The foregoing discussion deals with the 'what' and the 'why' of the UCR II vision. In a context where multinational or global action is the preferred result, the final critical issue is to identify the 'who'. Whatever the merits of the vision, no progress is possible on this scale unless a credible champion can be found. So, who could carry it off?

There are a number of candidates:

1. U.*S. Bureau of Customs & Border Protection*: CBP holds a critical leverage point within the Homeland Security apparatus. If it identified the 5 pillars of UCR II as its preferred architecture for moving forward, there is a good likelihood that the Department of Homeland Security could be enlisted into the concept and a parallel likelihood that members of Congress would sponsor supportive legislative proposals.

2. *Ridge-Manley*: UCR II would offer the Ridge-Manley bilateral process a choice between incremental upgrading of the Smart Border Accord and its 30-point action plan and its replacement by an integrated vision under the 5 pillars of UCR II. On its face, bilateral implementation of the 5 pillars is a sub-optimal choice, but it could be presented as a proof-of-concept initiative in the bilateral setting, with every intention of its expansion to other trading partners after a trial period.

3. *World Customs Organization*: This is a natural progression from the present voluntary UCR model within the WCO Customs Data Model. Inclusion of a "developing countries special measures package" and/or an "SME special measures package" – as one of the competitive evaluation features in the run-up to the formation of a PPP – could help include a good number of less developed economies within a WCO consensus to proceed under the UCR II vision.

4. *A Global E-business Consortium*: EAN*UCC and the leading vendors of PKI products would have an attractive opportunity to transform their modest customer bases for the GLN and PKI products into near global distribution channels. A private sector-led initiative and the effective transformation of significant intellectual properties into public goods would be an attractive feature for governments.

5. *APEC:* Regional sponsorship of an integrated vision under the 5 pillars of UCR II is a sub-optimal choice on its face. It could be presented as a proof-of-concept initiative in this regional setting, with every intention of its expansion to other trading partners after a trial period. Inclusion of a "developing countries special measures package" and/or an "SME special measures package" as one of the competitive evaluation features could help include a good number of APECs less developed economies within a consensus to proceed under the UCR II vision.

6. *Canada Customs & Revenue Agency:* Unilateral sponsorship of the 5 pillars of UCR II is a sub-optimal choice on its face. It could be presented as a proof-of-concept initiative and pursued for the early adopter savings and synergies that would accrue to Canadian firms and increase their competitive advantages in the global trading environment. In demonstrating the capture of these first order benefits by Canadian businesses, leverage would be generated to enlist the early participation of other international partners.

Conclusion

Trade corridor transparency and security can be achieved provided business processes are re-engineered, information management and communications strategies are optimized to exploit distributed processing in a shared global network, parties reach international agreement on a

layered and nested set of communications, security and accountability protocols required for a secure "spine" network and necessary private and public investments are made in a portfolio of technologies to support the whole effort.

The U.S. through an escalating series of unilateral demands placed its principal trading partners can attempt such a goal. Alternatively, it can be sought through formal international agreements or other multilateral mechanisms. Multilateral solutions would distribute accountabilities and incorporate a capability to identify and manage risks to the citizens, property and territory of each participating economy.

The measures are so extensive that international willingness to bear the related burdens and risks may only be attainable where economic and social gains are attended to as well as improved security outcomes.

The changed business processes that comprise the five pillars of the UCR II proposal are meant to ensure rapid emergence of electronic commerce as a predominant environment for global business-to-business commercial relations.

The critical issue in all of this is not simply to broadcast a new vision. Rather, it is to find the single champion or to form a core of co-adventurers who will persist long enough, far enough and with enough flexibility and pragmatism to deliver a working result of the vision.

About The Author:

Clyde McElman is Senior Advisor, Logistics & E-commerce, in the Strategic Policy Directorate of the Department of Transport in the Government of Canada. His reputation with colleagues is that of an outside-the-box contributor in responding to policy challenges. In 26 years as a manager with the Policy Group he has served in Director level policy positions related to railway and grain transportation and on several task groups to pursue legislative changes *(Canada Marine Act, Canada Transportation Act, Western Grain Transportation Act)*. Earlier, he served with the Council of Maritime Premiers in Halifax and with the Government of New Brunswick in Fredericton.

Endnotes

[1] The model covers over 160 data elements and provides uniform electronic messages for reporting cargo, for indicating location, identification of parties and transportation arrangements, providing quantities, value and other transaction data, making import and export declarations and for defining processes for border clearance approvals.

[2] Overview provided in December 2001 by Mr. Rob Quartel, Chairman & CEO of Freightdesk Technologies, to the U.S. Senate Government Affairs Committee

[3] Chart and the surrounding descriptions adapted from Chapter 5 of *Introduction to EANCOM © In Trade and Transport* http://www.ean-int.org/data/INTRANV3.pdf

[4] Comprised of up to 35 alphanumeric characters: the first character gives the year within a ten-year period; the next two give a country code for the supplier, seller or manufacturer who issues the UCR; the remaining 32 characters are split between an officially recognized national company identifier, e.g. Customs, VAT, DUNS, EAN ID number, and an internally applied company reference, e.g. purchase order or invoice number.

[5] See page 2 in
http://www.wcoomd.org/ie/En/Topics_Issues/FacilitationCustomsProcedures/Annex%20VII%20TF0004E3.pdf
[6] Traders who are known to the customs agency and approved for special or "fast track" procedures for the release and clearance of their goods.
[7] The Business Anti-Smuggling Coalition (BASC) is a business-led, U.S. Customs-supported alliance created to combat narcotic smuggling via commercial trade.
[8] Description based on: http://www.oecd.org/dataoecd/63/13/4375896.pdf , pp.2-3
[9] This standard 13 digit number has three parts; *a 3-digit lead portion assigned by EAN*UCC* that denotes the country, a 9-digit portion that is split *between a corporate identifier prefix assigned by EAN*UCC and trailing digits assignable by the enterprise to identify separate significant locations within its corporate structure; and finally, a check digit that is mathematically determined* by the preceding digits.
[10] Radio frequency identity tags that can send and in some cases receive wireless data over short distances.
[11] The Gartner Group formulated a five-stage development curve that it called the 'hype cycle' to describe a process that is typical to the adoption of new technologies. This representation of the hype cycle chart below is from:

http://www.ayeconference.com/wiki/scribble.cgi?read=HypeCycle
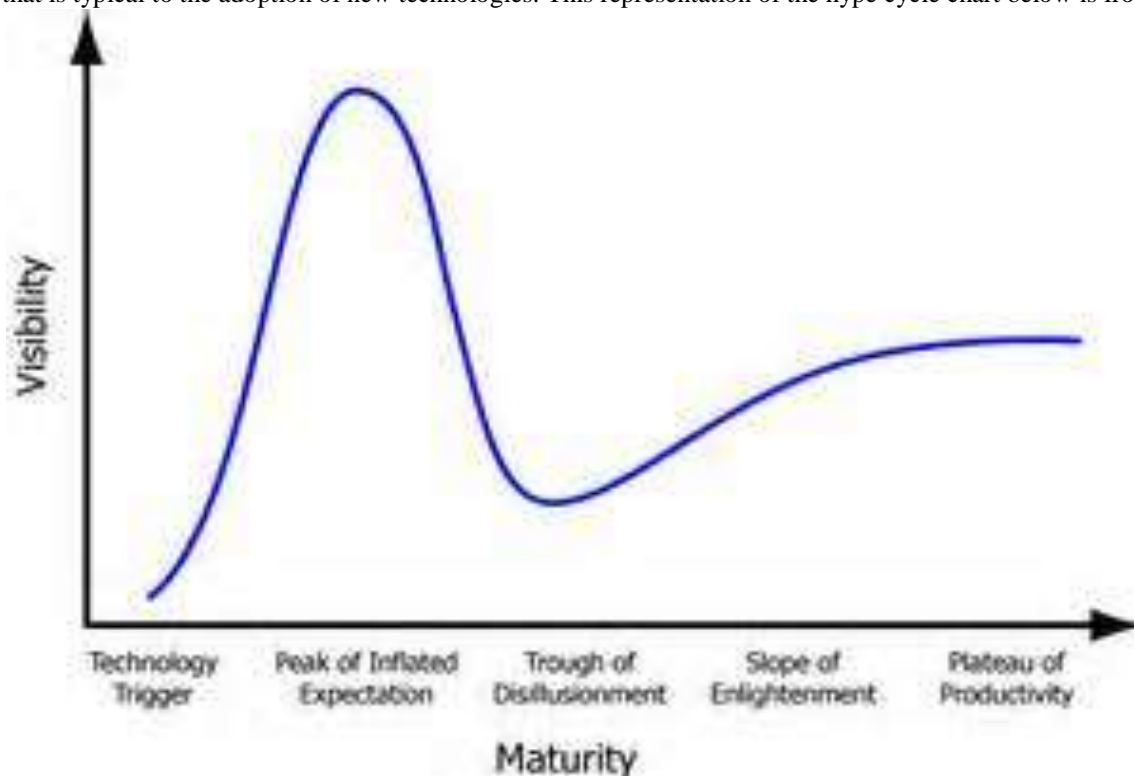
[12] A single PKI would do for sole proprietorships whereas differing sizes of enlarged packages might be the case for more complex corporate structures.
[13] Partial summary reported in ISO TC204 Liaison Report to UN/CEFACT TBG3, San Diego, March 13, 2003I
http://www.itsa.org/resources.nsf/Files/WG%207.2%20Annex%20A%20Onder%20Brief%20To%20UN%20CEFACT-TBG3/$file/Annex_A_Onder_Brief.pdf