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To: John Graham/OMB/EOP@EOP
cc: See the distribution list at the bottom of this message
Subject: Comments on cost-benefit analysis for Homeland Security rules

Dear Dr. Graham,

Please find attached some comments on cost-benefit analysis for Homeland Security rules.

As you may well be aware, RMS has developed a probabilistic model for terrorism risk, which would expedite such cost-benefit analysis.

(See attached file: OMBHS.DOC)

Best regards,

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----- Forwarded by Gordon Woo/RISKINC on 24/03/2003 09:54 -----

- OMBHS.DOC

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THE BENEFITS AND COSTS OF HOMELAND SECURITY RULES

Comments prepared for the Office of Management of Budget

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PROBABILISTIC TERRORISM RISK ASSESSMENT

The methodical evaluation by federal agencies of the benefits and costs of homeland security rules serves the important objective of providing a high level of public protection against terrorism, without undue disruption to daily life and commerce. Whatever factors may tilt the balance between protection and disruption, decisions should be informed by a probabilistic assessment of terrorism risk. Just as the intuition of environmentalists may not provide the best societal solution for environmental protection, so the intuition of law enforcement personnel may not provide the best overall answer for homeland security.

As with other probabilistic risk assessments involving human action, e.g. those associated with environmental policy, the insights afforded by a risk perspective are illuminating in their own right, and helpful for resource allocation, despite the obvious challenges and inherent uncertainties involved in behavioral modeling. In common with environmental legislation¹, cost-benefit analysis for security regulations has to develop some yardstick for loss of freedom, disease incidence, the saving of human life, and the value of costs and benefits to future generations.

The principal stages in a probabilistic terrorism risk assessment are as follows:

- Understanding the terrorists' modus operandi;
- Prioritizing targets by location and type;
- Identifying modes of attack and weapon preferences;
- Modeling the temporal occurrence of attacks;
- Evaluating the loss consequences of each attack scenario.

Each stage requires substantial time, effort, and expertise to accomplish. As with all probabilistic risk assessments, a residual degree of subjectivity requires some recourse to expert judgement. In this regard, the use of recognized terrorism experts with an

¹ e.g. C.R. Sunstein (2002) *Risk and Reason: Safety, Law, and the Environment* (Cambridge University Press)

international perspective on Al Qaeda is particularly important, given the global domain of this terrorist network. Serving the pressing need of US insurers to price and manage portfolios of terrorism risk, RMS (Risk Management Solutions Inc.) has developed, since 9/11, the capability to undertake probabilistic terrorism risk assessments. Apart from senior CIA and FBI personnel, world experts on terrorist weapons, and Islamic militancy in the Middle East, Asia and Europe have contributed to this capability. Terrorism research projects aimed at refining this capability are ongoing at RMS. Individual federal agencies might seek to replicate this technical capability on their own, but use of an existing probabilistic model, (or even some basic components of an existing model), would be an expeditious and efficient option.

Among the possible issues which may be quantitatively addressed by a probabilistic terrorism model is the effectiveness of proposed new federal regulations.

EFFECTIVENESS OF NEW FEDERAL REGULATIONS

Some federal regulations may provide extra safeguards against a general type of terrorist threat. In this category are regulations which tighten border, visa and immigration, and transport controls, and so impose additional barriers against entry into the USA of terrorists and their weapons and materials. Such regulations are especially cost-effective, since they achieve the benefit of reducing the overall probability of a successful attack occurring within the USA.

Other federal regulations are designed to harden a specific class of targets within the USA, and so reduce their vulnerability to a terrorist attack. These have the benefit of reducing the attack risk at these targets. However, the costs of these latter regulations should allow for the negative externality of risk transfer to alternative softer targets. For example, the hardening of one class of industrial facility (e.g. oil refineries) may enhance the risk to another class (e.g. chemical plants). Similarly, hardening airports against surface-to-air missile attack may divert terrorists to launching such attacks over less protected urban areas.

Like the flow of water, terrorists follow the path of least resistance, and there is an apposite analogy with river flooding: strengthening local river defenses around one community may impact negatively on communities downstream. Whether for flood or terrorism protection, it is appropriate that the strength of local defenses should be commensurate with the value of the loss potential, but the induced additional risk to others should be recognized. Given that terrorists will take alternative soft targets of opportunity, if hard targets are too difficult, the overall public benefit of hardening specific targets within the USA is lessened. Just as in flood control, acceptance may be deliberately made for certain areas to be inundated for the greater good elsewhere, so in terrorism control, protection around some key potential targets may not be enhanced, so as to avoid deflecting the risk elsewhere. Such decisions on target hardening may involve sensitive issues such as weighing mass public casualties against loss of economic or symbolic value.

An illustration of such decision-making is provided by IRA terrorism. During the IRA campaign in England, substantial economic disruption, (but no casualty), was caused by the bombing and subsequent closure of Hammersmith bridge in West London. This was a soft target for a local IRA cell, since bridge security was minimal at night. But had security been tightened at this bridge, the IRA cell may well have substituted a softer public target, e.g. a local bar or restaurant, with the possibility of a substantial number of casualties. In a local community, the existence of an economically or symbolically attractive, (but casualty-light), 'honey-pot' target, which is not excessively protected, may serve to draw terrorist attention away from casualty-heavy targets.

AUXILIARY BENEFITS

Addressing some types of terrorist action, federal regulations would carry the benefit of thwarting similar modes of criminal action. Thus regulations which are designed to limit the loss from a conflagration caused by terrorists, would tend to limit arson loss generally. The same holds for industrial and agricultural sabotage, food and water contamination, cyber-attacks etc.. Historical rates of such criminal activity provide some input for estimating the value of these auxiliary benefits. In the case of criminal importing of infected meat, some probabilistic risk assessments have already been undertaken (in UK), in respect of a potential foot-and-mouth epidemic.

BENEFITS FOR INSURANCE

Just as earthquake and wind loading regulations for buildings carry significant benefits for property and casualty insurance, so do federal regulations which reduce terrorism risk. These benefits may be gauged from actuarial calculations of reductions in expected annual loss for insurance portfolios.