

**ANALYTICS FOR BUSINESS, POLICY AND LAW IN
A COMPARATIVE REVIEW OF
ENHANCED WIRELESS EMERGENCY NUMBER
CALL SERVICES SYSTEMS
IN THE EUROPEAN UNION AND UNITED STATES***

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I. INTRODUCTION

Imagine you are attending a conference at a resort somewhere in North America, Europe or another continent. While relaxing in your spacious bungalow or room, your right arm starts to shake, with numbness running from your fingers to your elbow, and you hear your heart pounding loudly in your chest. You just know that you need immediate emergency medical assistance. Responding like a creature of habit, you quickly grab your cellular telephone and dial the local emergency call number that is near the nightstand in your room. You scream "please help me, I am dying of a heart attack!" Immediately thereafter, you give your first name and then lose consciousness before you can give your precise location. The emergency center receives your cellular telephone number but is not equipped to determine your location. Based on this small center's past experiences with local emergencies, it gives the resort your first name and cellular telephone number in about three minutes. In approximately four minutes, the resort finds your first name and number in its database and enters your bungalow or room. Fortuitously, your numbness and pounding are just a bad case of intestinal gas. You are alive and well. Of course, others have not been as fortuitous.¹

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Against the backdrop of the global dependence on wireless, mobile or cellular technologies and their imminent public policy implications are excruciating needs for effective public safety, telecommunications, privacy, liability and economic policies. National or regional regulation and policies would *obligate* wireless carriers to transmit timely, accurate *location information* to establish and implement enhanced *wireless* emergency call number systems that receive wireless callers' requests for emergency medical, fire, police and rescue services and assistance.² The 911 emergency wireline

Hill, 1983.

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1. See Anne Marie Squeo, *Cellphone Hangup: When You Dial 911, Can Help Find You?*, WALL ST. J., May 12, 2005, at A1. There have been numerous incidents where wireless subscribers or callers have suffered or died unnecessarily because emergency centers could not determine their precise location. See *id.* Ms. Squeo reports that “[i]n March [2004], a man died in a Long Island snowstorm after calling 911 from an older cellphone that couldn’t transmit his coordinates, even though the local call center had satellite-locator technology.” *Id.* at 2. In the aftermath of that incident, New York City installed an enhanced wireless call number system that receives the wireless callers’ telephone numbers and locations. *Id.* at 5. The global use of wireless telephones means that the Long Island incident can occur anywhere in the world that does not require wireless carriers or operators, to transmit to emergency centers both the telephone number and location information of emergency callers.

2. See MARTII LUMIO, EUROPEAN COMMUNITY, TELECOMMUNICATIONS IN EUROPE, (2006), available at <http://observatorio.red.es/documentacion/actualidad/boletines/statistics.pdf> [hereinafter EU Telecommunications Statistics]. The European Community publication finds that:

[t]he rapid growth of mobile telephony continued in 2004. In absolute numbers, it even accelerated. In relative terms, however, it slowed down. The average annual growth rate of 36.2% over the eight year period 1996–2004 is still impressive. The largest markets in terms of the total number of subscriptions were Germany (71.3 million), Italy (62.8 million) and the UK (61.1 million).

...

The number of operators has in general slightly risen, but in some cases the opposite is true. In 2004, every Member State had more than one operator, which should guarantee a degree of competition throughout EU.

Id. Another communications problem facing the global society is blurring of telecommunication and information technology boundaries. See *id.* *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, On the Review of the EU Regulatory Framework for Electronic Communications Networks and Services*, at 6, COM (2006) 334 final (June 29, 2006) [hereinafter *Communication on Regulatory Framework of Telecommunications*] (discussing the need for convergence of markets in a single European market). New services will provide voice, TV, and internet. *Id.* at 6. Finally, the telecommunications regulatory frameworks must be capable of addressing new technologies, such as the Voice over Internet Provider (VOIP). See

call services system originated on the European continent in 1937³ In fact, England created the first emergency call services system.⁴ In the 1960s, Haleyville, Alabama adopted the first American 911 wireline emergency call number services system.⁵ European national and American state governments had adopted the wireline emergency call services system that required wireline carriers to transmit to emergency personnel the telephone numbers of callers who need emergency medical, fire, police and other services.⁶ Presently, the wireline carriers must transmit to emergency personnel both telephone numbers and locations for emergency callers who request emergency services or assistance in the European Union⁷ (EU) on call number 112, or in the United States⁸ on 911. Transmitting both telephone number and location information creates enhanced *wireline* emergency call number systems that are E911 and E112 of the U.S.⁹ and EU,¹⁰ respectively.

This Article compares and contrasts public safety, business and telecommunications policy guidance, policies and regulation to establish, implement and sustain enhanced *wireless* E911 or E112. Part I outlines and explains the scope of the article as a comparative analytical review of U.S. and EU policy guidance, policies and regulation of business and markets to secure and provide public safety.

A. *Illustrating the Impact of Policies, Business, Market and Laws on EU and U.S. Emergency Call Systems*

This Article first uses a macro-analytical framework of policy or environmental forces and their interests and then uses micro-analysis of

id. The EU and U.S. policy-makers are both reviewing and considering regulation of VOIP. See European Telephone Network Operators, Annual Report 2004, at 16, available at <http://www.ETNO%20Annual%20Report%202004.pdf>.

3. Peter P. Ten Eyck, *Dial 911 and Report a Congressional Empty Promise: The Wireless Communications and Public Safety Act of 1999*, 54 FED. COMM. L.J. 53, 55 (2001) (citing Betram A. Maas, Comment, "911" Emergency Assistance Call Systems: Should Local Governments Be Liable for Negligent Failure to Respond?, 8 GEO. MASON U. L. REV. 103, 103 n.1 (1985)).

4. Ten Eyck, *supra* note 3, at 53.

5. *Id.* at 56 (citing Implementation of 911 Act: The Use of N11 Codes and Other Abbreviated Dialing Arrangements; Compatibility with 911 Emergency Calling Systems, 65 Fed. Reg. 56752, 56752 (Sept. 19, 2000)).

6. See Council Decision 91/396, Introduction of a Single European Emergency Call Number, 1991 O.J. (L 217), [hereinafter Decision 91/396/EEC]; See *infra* Part IV and accompanying notes (examining European Community communications and public safety policies and laws establishing and implementing emergency call services numbers); see Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81, 113 Stat. 1286 (1999) (codified at 47 U.S.C. § 251 and other sections of 47 U.S.C.); see *infra* Part V and accompanying notes (examining United States communications and public safety policies and laws establishing and implementing emergency call services numbers).

7. See Decision 91/396/EEC, *supra* note 6, at 2.

8. See 47 U.S.C. § 251 (2006).

9. See *id.*

10. See Decision 91/396/EEC, *supra* note 6, at 2.

business, legal and policy criteria to conduct a comparative review of EU and U.S. policy guidance, policies and regulations establishing and implementing enhanced *wireless* emergency number call systems. The comparative review illustrates how wireless telecommunications technology, and its regional business-market concerns and state public safety needs, create similarities and differences in designing and enforcing E112 and E911 policy guidance, policies and regulation. Collectively, it is public safety, telecommunications, personal privacy, tort liability and economic policies that establish and implement enhanced wireless emergency call number regulatory scheme in the U.S. and EU. These emergency call number schemes impact the lives, welfare and security of tens of millions of wireless subscribers who are not permanently fixed at any one location but who make millions of wireless emergency calls from various locations in the U.S. and EU.¹¹ In terms of the impact of these schemes on business and markets, wireless E911 and E112 regulatory schemes force wireless carriers or telecom operators to absorb the cost of developing, deploying, and diffusing location acquisition, networking and other communication technologies. These carriers or operators must transmit to public safety answering ports (PSAPs) or emergency call centers the telephone numbers and locations of wireless subscribers or callers in the EU¹² and U.S.¹³

1. Nature of the Analytics Utilized to Review the Use of Telecommunications Regulation to Address Public Safety Needs

This Article uses environmental and policy forces and business and policy criteria of macro- and micro-analytical frameworks, respectively, to

11. COORDINATION GROUP ON THE ACCESS TO LOCATION INFORMATION FOR EMERGENCY SERVICES (CGALIES), FINAL REPORT: REPORT ON IMPLEMENTATION ISSUES RELATED TO ACCESS TO LOCATION INFORMATION BY EMERGENCY SERVICES (112) IN THE EUROPEAN UNION, 10 (2002) [hereinafter CGALIES Report] (an inquiry by an EU Coordinating Group consisting of public and private sector members to study the implementation of 112 in the EU). The CGALIES Report found 40 million calls were made from cellular phones in the EU. *Id.*; see DALE N. HATFIELD, A REPORT ON TECHNICAL AND OPERATIONAL ISSUES IMPACTING THE PROVISION OF WIRELESS ENHANCED 911 SERVICES, ii, (2002), available at http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6513296239 (an inquiry by a Telecommunications Consultant for the Federal Communication Commission (FCC) as to the technical and operational issues affecting the deployment of wireless Enhanced 911 (E-911) services in the United States, recognizing 130 million wireless subscribers existed in the United States).

12. See Commission Recommendation 2003/558, Processing of Caller Location Information in Electronic Communication Networks for the Purpose of Location-Enhanced Emergency Call Services, 2003 O.J. (L 189) 49 (EC) [hereinafter Recommendation 2003/558/EC]; Council Directive 2002/22, art. 26, 2002 O.J. (L 108), 51, 65 (EC) [hereinafter Directive 2002/22/EC].

13. See 47 U.S.C. § 251 (2006) (providing pertinent parts of the Wireless Communications and Public Safety Act of 1991); Ensuring Needed Help Arrives Near Callers Employing 911 Act of 2004, Pub. L. No. 108-494, Title I, 118 Stat. 3986 (codified at 47 U.S.C. § 615 and other parts of 47 U.S.C.).

review how U.S. and EU policies address conflicting interests present in regulating wireless carriers, accommodating member states, coping with emerging digital technologies, considering the telecommunications industry, and providing public safety for wireless subscribers. Implementing wireless E911 and E112 for the U.S. and EU has proven long and drawn out, if not elusive, in that contributing policy-making and environmental forces are not, and have never been, totally subservient to public safety and other social needs.

This Article examines policy guidance, public policy and regulation by using business, legal and policy analytics to conduct a comparative analytical review of U.S. and EU enhanced wireless emergency call services systems. Against a global backdrop and the certain universal need for emergency call number systems, this Article applies these analytics to show how EU and U.S. technological, political, economic, social and public policy forces and their most dominant interests influence U.S. and EU legislative, agency and other policy-making in establishing and implementing enhanced wireless emergency call service system policy guidance, policies and regulation.

2. Finding Policy Guidance and Business and Market Concerns in Establishing E112 and E911

This comparative review finds and examines similarities and differences caused by the most pertinent underlying interests of economic, social, technological, political, and public policy forces, singly or jointly, influencing the design, enactment and implementation of U.S. and EU enhanced emergency services policies. With an eye toward identifying EU and U.S. policy-making flaws and troublesome conflicts between public and business interests, this Article examines public policy, legislative findings and objectives, and business and market decisions and strategies that have been made in designing, establishing, implementing and sustaining U.S. and EU enhanced wireless emergency systems. Both EU and U.S. telecommunications and public safety policy-making and business and market regulation impact the telecommunications, information management systems and information technology industries and the ability of state and local governments to provide emergency services and other public safety services. This Article identifies business concerns and market restraints that influence strategic industry programs and operational business decisions, such as developing and marketing new communications technology. Thus, this Article sets forth public policy guidance to address public policy failures and ineffective regulation, such as the business costs of providing public safety benefits.

B. Outlining the Nature and Analytics of Policy-Making Approaches and Policies in a Review of U.S. and EU Emergency Call Number Systems

This Article consists of seven parts that set forth and apply legal, policy and business market analytics to find and examine how and why similarities and differences exist in the influence and impact of economic, social,

technological, political and public policy forces. Specifically, this application uses pertinent underlying interests and business and policy criteria of these EU and U.S. forces to ascertain how economic, industry and other forces might impact establishing, implementing and sustaining U.S. and EU enhanced emergency services policies. Part I introduces these forces, interests, and criteria as the analytics of a comparative review of policy guidance business, regulation and public policy. Part I is the Introduction and raises a question regarding the *global* policy, legal and business implications of similarities and differences in U.S. and EU policy guidance, policies and regulation for enhanced wireless emergency call service systems to locate and assist wireless or cellular subscribers requesting emergency assistance on the *ubiquitous* cellular or wireless phone. The question is a global policy concern for national and regional governments that presently rely on cellular or wireless phones to bring communications to isolated and undeveloped regions. In these areas, the lack of automatic location technology for emergency assistance means that visitors and local citizens may not be able to rely on cellular phones to request emergency assistance in all circumstances.

1. Nature of Business, Regulation and Public Policy in Conducting a Comparative Review

Part II discusses the nature of seminal public and private interests, identifies pertinent regional policy-making forces and introduces the management of policy-making, policies and regulation to establish and implement enhanced wireless emergency services in the EU and U.S. Part III discusses the state of cellular and automatic location information (ALI) technologies and the nature of EU and U.S. policy-making schemes. It also creates and establishes an analytical framework to find and examine the impact of technology, public policy, economics, social and political forces and their most pertinent underlying force-specific interests on U.S. and EU enhanced wireless emergency number call services policy-making and policies. Parts II and III build the analytical framework that identifies forces and elements used to compare and contrast EU and U.S. policy guidance, policies, and regulation set forth in Parts IV and V. Part IV summarizes pertinent EU public policy-making that includes EU decisions, recommendations and committee actions¹⁴ establishing and implementing an E112 or enhanced wireless emergency call service by relying primarily on the use of a single wireless cellular standard and one type of ALI technology. Part V summarizes pertinent U.S. telecommunication and public safety policy-making that includes U.S. legislative acts, agency regulation and their public objectives and purposes for establishing and implementing an E911 or enhanced wireless emergency call system that voluntarily relies on competing wireless standards and ALI technologies.

14. See *infra* Part III.C and accompanying notes.

2. *Reviewing Dissimilarities of Government Means and Public Ends by Using Comparative Analytics for Legislative Substance*

Parts IV and V examine inherent substantive differences or dissimilarities of EU and U.S. policy guidance, policies and regulation by legislatures and agencies establishing and implementing enhanced wireless emergency services systems. Moreover, Part VI compares and contrasts U.S. and EU policy guidance, policies and regulation establishing and implementing E911 and E112, respectively, using the comparative public policy-business market analytical framework.¹⁵ This analytical framework recognizes, finds and then examines the most pertinent policy or environmental influences on legislative and agency policy-making and ascertains how one or more force-specific interests shaped and dominated the direction of U.S. and EU emergency call services policy-making and policies.¹⁶ The application of *this* public policy-business market analytical framework to EU and U.S. public safety policies established under telecommunications policy and regulation leads to two seminal conclusions as source of business and market suggestions and public policy guidance for establishing and implementing enhanced wireless emergency call number systems.

Part VII, the Conclusion, contains suggestions that have national and global policy implications for the need to establish and implement emergency number call systems. The first conclusion is that location-based and wireless business, market competition, technology development, intergovernmental relations, telecommunications and public safety are more likely the most dominant interests, but are also conflicting interests substantially influencing the policy-making shaping the direction of U.S. and EU policies and substance of regulations to establish and implement enhanced wireless emergency call number services systems. The first conclusion encompasses the fact that the telecommunications and location information technologies needed to implement enhanced wireless emergency call systems present business and market concerns that presently exist under both U.S. telecommunication policy to preserve interstate competition and EU telecommunication policy to create inter-European market and competition. In fact, EU and U.S. communication policy-making and policies illustrate an emerging global policy concern between the use of cellular or wireless phones to provide basic rural and urban communications and the need to establish enhanced emergency call number services in developing and underdeveloped countries.

The second and ultimate conclusion is that any similarities and differences in U.S. and EU policies and regulation result primarily from the fact that U.S. and EU public interests and their respective policy forces may be accorded different weights or priorities in U.S. and EU public safety, national security, fiscal and telecommunications policy-making. The second conclusion

15. *See infra* Part III.A and accompanying notes.

16. *See infra* Part VI and accompanying notes.

may result from the fact that EU and U.S. policy-makers who establish E112 and E911 have shown much deference or comity to sovereign states that must manage municipal governments and PSAPs to implement enhanced emergency call services systems and that must console Local Exchange Carriers (LECs) and wireless carriers to develop, deploy and diffuse telecommunications technology to transmit timely, accurate emergency calls by wireless subscribers.

A comparative analytical review of E911 and E112 emergency call systems requires an analysis of business and market situations and policy-making and policy environments of unique or entirely different regions. This analytical review compares and contrasts broad environmental forces and their interests that impact the design, enactment and implementation of emergency call number service policy guidance, policies and regulation. This analytical review compares and contrasts policies and regulation but does not always attribute differences and similarities to public needs and welfare. This analytical review identifies and examines policy or environmental forces and their interests and relies on business, market and policy criteria to examine and explain the impact of a force-specific interest on policy guidance, policies and regulation of a region's emergency call number service.

C. Recognizing the Nature of U.S. and EU Emergency Call Services Systems

This comparative analytical review of U.S. and EU public policy and their business and market impacts necessarily identifies, analyzes and weighs pertinent European and American technological, political, economic, social and public policy forces and then identifies their most dominant or pertinent interests from an examination of EU and U.S. business and market commentaries and studies, legislative hearings and acts and agency reports and regulations. These interests support and justify establishing and implementing policies and regulation to create emergency call services systems. These policies and regulation are telecommunications policies and legislation to govern telecommunication, information management and information technology organizations and their industries, such as wireless carriers and location information providers.

In making policies and regulation, similar or different types of governments, such as confederalisms¹⁷ and federalisms,¹⁸ may pursue entirely

17. JOHN MCCORMICK, UNDERSTANDING THE EUROPEAN UNION: A CONCISE INTRODUCTION 6-7 (2d ed. 2002). Mr. McCormick states, "[c]onfederalism is a loose system of administration in which two or more organizational units keep their separate identities but give specified powers to a central authority for reasons of convenience, mutual security or efficiency." *Id.* In confederalism, the central government makes laws for the states, but exists solely at the discretion of the states. *Id.* at 7.

18. *Id.* at 9. Federalism is a "system . . . in which at least two levels of government – national and local – coexist with governments separate or shared powers, each having clearly defined and independent functions but neither having supreme authority over the other." *Id.*

different public policy and business-market approaches that lead to different government means and objectives to establish and implement legislative policies.¹⁹ The EU fits neither the confederalism nor federalism designation,²⁰ and even if both the EU and the U.S. are federalisms, they may not necessarily share similar public policies, legislative means and business and market objectives to establish and implement enhanced wireless emergency number call services policies. Both the U.S. and EU can impose regulatory mandates on business organizations, namely wireless carriers²¹ and local exchange carriers (LECs),²² and impose voluntary and a few mandatory obligations for governments, namely states,²³ municipalities and counties, including their public safety answering points (PSAPs).²⁴ In applying elements of both approaches, this comparative analytical review uses environmental, business and legal analytics to examine and weigh the impact of emergency call number services policies and regulation on the policy guidance and policies and business and markets of telecommunications, information management and information technologies.

The United States of America is a federal system.

19. *See id.* at 12-18; *See* WALTER VAN GERVEN, *THE EUROPEAN UNION: A POLITY OF STATES AND PEOPLES* 34-35 (2005). Professor van Gerven explains the recognition of an EU policy and its implementation through legislative acts by stating:

[I]n the European Union sovereign powers that are enjoyed by the Union are exercised by EU institutions with the participation of Member State authorities. That is particularly the case of the Council of Ministers, which is part of the Union's legislative branch, in which national ministers participate, as members of the Council in making and preparing Union law and policies.

VAN GERVEN, *supra*, at 35. Moreover, the EU is a regional integration bringing together countries at different social, economic, and political levels for various reasons. MCCORMICK, *supra* note 17, at 12-13. The EU has achieved some level of economic integration through the development of a single market for trade and monetary system. *Id.* at 13, 167-68. The EU has achieved a level political integration as a weak or lesser confederalism. *Id.* at 13. Political integration exists in EU institutions or central governments sharing some lawmaking, judicial, and enforcement powers with member states. *See id.* at 13, 118-19. Thus the central government has the power to recognize European public policy and address it with legislative acts. *See id.* at 118-19. The obvious difference in U.S. and EU levels of political and economic integration is a determinant of the nature of public safety and other social policies and their relationship with business markets in the development of a single market. *Id.* at 13-14. One example is the creation of cross border competition within Europe among wireless carriers and other telecommunication operators.

20. *See* MCCORMICK, *supra* note 17, at 8-10. The United States is a federation. *Id.* at 9-10. The EU is neither a federation nor confederation and shares qualities of both types of governmental systems. *See id.* at 8-9, 11.

21. *See* 47 U.S.C. § 222 (2006); Decision 91/396/EEC, *supra* note 6.

22. *See* Hatfield, *supra* note 11, at 32 (recognizing the role of local exchange carriers (LECs) as the interface between wireless carriers or operators and public safety answering points (PSAPs)); *see* CGALIES Report, *supra* note 11, at 26 (addressing the need for interface and interoperability between Telecom Operators or LECs and PSAPs).

23. *See* 47 U.S.C. § 615 (2006) (not permitting the FCC to impose obligations or costs); *see infra* Part VI and accompanying notes (contrasting and comparing EU and U.S. policy guidance, policies, and regulation).

24. *See* 47 U.S.C. § 615 (2006).

1. *Describing Policy-Making Approaches of Public Needs and Objectives*

One policy-making approach is a business-market approach that supports, accommodates and weighs favorably the private interests of business organizations, commercial markets and technology industries while it furthers or advances various public interests, such as public safety.²⁵ This business-market approach identifies, examines and weighs the impact of the business and market on specific legislative policies, where such business and markets include wireless carriers and location-based providers. These policies and regulation of legislatures and agencies or commissions establish, implement and sustain public programs, such as enhanced wireless emergency call number services. Foremost, the business market approach and its public policy objectives determine whether public programs, such as E911 or E112 systems, are partially or totally dependent on another business or industry and are subject to its policies for implementation and sustainability, such as the development of ALI and telecommunications technologies and their impact on the implementation of E112. Next, the business-market approach determines whether regional policy-makers are supporting the dominant business and markets at the expense of the subservient market for economic and other reasons, such as to bolster both domestic and international competition. Furthermore, the business-market approach determines how business restraints and indifference to market solutions, such as commercialization of ALI technology, in the dominant business and markets, namely the telecommunications industry, affect the less dominant or subservient public policy, namely public safety. Under the business-market approach, a comparative review explains how policy guidance, policies, regulation favorable to business and markets, such as the telecommunications industry, impact establishing and implementing a public safety program, such as E112 and E911.

Another policy-making approach is a public policy approach that includes public objectives that further public interests with little emphasis on finding business solutions and market ideas to preserve an economic force and its force-specific interests, such as the economic system and competition among competitors.²⁶ Foremost, the public policy approach identifies, examines and weighs social needs, political interests and other force-specific or policy concerns of regional policy-making to establish and implement public programs, such as E112 and E911. Next, the public policy approach determines how policies and laws designed to protect a public interest by establishing and implementing a public program, such as public safety, relate to other public policy and interests, such as telecommunications policy. Furthermore, the public policy approach determines the importance and priority

25. See *infra* Part II. C. 2 and accompanying notes.

26. See *id.*

assigned pertinent social needs, economic wants and other public or private interests in policy-making to establish policies, such as telecommunications legislation. Finally, a comparative review of a public policy-centered approach explains the weight or emphasis government policies and regulation of competing public and private interests place on or give to business or industrial and commercial or market interests in legislative and agencies policy-making to establish and implement E911 and E112.²⁷ This comparative analytical review examines business-market and public policy approaches to explain the nature and impact of policy forces and their dominant interests on E112 and E911 policy guidance, policies and regulation.

2. *Examining Public Policy and Business and Commercial Markets*

Giving greater weight to public interests in regional or national policy-making usually produces policy choices, namely legislative mandates, to provide for social welfare and political needs, such as emergency services, though economic and technology forces may have other needs and demand other policy choices. As set forth below in Part III.C, a comparative analytical framework of E112 and E911 policy guidance, policies and regulation identifies and examines broad domestic policy forces and dominant force-specific interests²⁸ to evaluate the impact of these forces on region-specific policies and regulation and business and commercial markets. As demonstrated in Part VI, the analytical framework analyzes and ascertains the likelihood that any one or more policy or environmental forces and their interests, such as politics and its form of government, respectively, causing or exerting a substantial level of influence on establishing or implementing enhanced emergency call services policies and regulation. As set forth below in Part III.C, the comparative analytical framework examines narrow interests among and within economic, political and other forces using business, market and public policy criteria to evaluate the role, nature and influence of these narrow interests, such as industrial competitiveness, commercial markets and public safety, in the design of telecommunications, information management and information technology policies.

This comparative analytical framework considers public and private forces and the most influential interests that could be minimized by giving greater weight or priority to emerging public safety needs created by the deployment and diffusion of new technologies. Weighing particular force-specific interests such as competitiveness in wireless carrier markets, reveals the tension between business interests of the technology industry and public

27. See 47 U.S.C. § 615. The pertinent language of Section 102 of the Act states, "for the sake of our Nation's homeland security and public safety, a universal emergency telephone number (911) . . . should be available . . ." *Id.*

28. See *infra* Part III.C and accompanying notes.

safety interests of society. To illustrate, the deployment, adoption and diffusion of cellular standards and location information technology do not make E112 or E911 services accessible to all subscribers who purchase and use cellular phones.²⁹ Legislative and agency policy-makers must consider economic, technology and other interests, such as the protection of individual privacy, the cost of developing technology and detection of national security threats, in the policy-making process of increasing accessibility to emergency number call services. A comparative analytical review of E112 and E911 policy-making and policies needs a comparative analytical framework powerful enough to recognize the influence of policy-making and policy forces and their respective force-specific interests. Moreover, this framework uses narrower business, market and policy or political criteria to examine policy guidance, policies and regulation enacted and implemented to address public policy, business and market concerns raised by less harmonizing state government and wireless carrier needs.

II. POLICY FORCES AND THEIR INTERESTS AND COMPARATIVE ANALYTICS OF EMERGENCY CALL SERVICES POLICIES

The U.S. and EU have established and implemented enhanced wireless emergency call services policies that were made using policy-making to consider and weigh the impact of U.S. and EU politics, economics, social, technology and public policy and their underlying interests in the need for public safety mandates for wireless E112 and E911. This policy-making affects business organizations and product and service markets of the telecommunication industry, which must develop, adopt and diffuse wireless cellular standards (WCS),³⁰ automatic location information³¹ (ALI) and telecommunications technologies.³² The business of the communications and telecommunication industry includes providing the software and hardware used to locate subscribers and transmit location and other information for enhanced wireless emergency call services. Establishing and implementing the E911 or enhanced wireless emergency call system policy must advance public safety interests, but must also accommodate business development and market interests, further technology development and other technology interests, and meet intergovernmental and other political interests.

29. See Squeo, *supra* note 1, at 1.

30. See 47 U.S.C. § 615 (2006).

31. See *infra* Part III.B and accompanying notes.

32. See *infra* Part III.C and accompanying notes.

A. *Governmental Nature of Policy Forces and Their Interests Influencing EU and U.S. Policy Making and Policies*

The nature of economic, social, political, technological and public policy environments consists of American and European forces influencing U.S. and EU, respectively, policy-making and policies and business development and markets. Examining these forces, interests and their impact on private business and markets and government policies and regulation involves legislative and agency policy-making to further public safety and welfare needs, recognize the business and market impact on the telecommunication industry and affect state lawmaking to implement municipal or county emergency call number services. As stated above, our comparative analytical framework is a public policy-business market approach.³³ However, this approach shows that EU and U.S. policies and national and state policy-making forces and their underlying interests may be given different weights and priorities in legislative or agency policy-making under unique territorial circumstances, such as culture, history, economic status and others. Under this approach, any reference to state means a U.S. state or EU member state that has a mandatory or voluntary obligation to implement emergency call number services under U.S. or EU communication policies.

33. *See infra* Part III.A and accompanying notes. The analytics include an analytical framework that is applied to ascertain the most pertinent policy-making and policy forces and their business market interests impacting E911 and E112 policy-making. The analytics include the consideration and weighing of policy choices made by legislative, agency, and quasi public policy-makers in choosing among competing and conflicting policy forces and their respective interests. *See infra* Parts IV, V and accompanying notes. The analytical framework analyzes public policy, legislative law, policy and agency regulations of public safety and communication fields, and the impact of public safety and telecommunication policy guidance, policies, and regulation on the business and market interests of the telecommunications industry. *See infra* Part VI and accompanying notes.

These analytics are a qualitative analytical approach to examining the more significant impact of economic, social, technological, political, and public policy forces and their most pertinent underlying interests on U.S. and EU public policy-making and policy to establish and implement enhanced wireless emergency services. Of course, an empirical or quantitative analysis would more readily identify these forces and their respective interests and their most likely impact on EU and U.S. public safety and communication policy-making and policies for emergency call services. But that is no guarantee that policy-makers would make other policy choices.

We see the need for the quantitative or empirical analysis of the impact and use of new and emerging telecommunication technologies on the relationship between public policy and business and market interests. *See supra* note VI and accompany text (recognizing the impact of new telecommunication technology on the erosion of privacy). In the meantime, our qualitative approach provides usable indicators of the most likely impact of political, social, economic, technological, and public policy forces and their underlying interests on establishing and implementing U.S. and EU emergency call services policies and laws.

1. *State Forces and Their Interests in the Design of Regional or Federal Policy-Making and Policies*

All policy-making and policy forces and their interests at work in the U.S. and the EU may not be exclusively American or European, such as national security, or even exert a total EU or U.S. territorial need, such as monetary policy. The U.S. and EU consist of sovereign governments that have different, if not unique, cultures, demographics, economies and other policy forces. These forces are state, regional and municipal, in many instances, in their policy-making impact or influence on public and business interests and commercial markets. However, state forces can impact U.S. and EU public policy-making depending on the nature and importance of an underlying interest of the state force, such as ethnic identity underlying cultural force. State forces may include culture, politics, privacy, economy and other matters of limited national influence and often overlapped by U.S. and EU environmental or policy forces. In fact, a state force and its underlying interests may eventually point out weakness in EU and U.S. policy-making and their relationship with technology, economics, social, politics and public policy.³⁴

2. *Impact of Intergovernmental Politics and State Needs and Interests on Regional Policy-Making*

Government documents, such as treaties and constitutions, establish intergovernmental relations and how the existence of economic, social and other policy forces and their interests will impact regional policy-making and its policies and regulations.³⁵ Thus the political force of states in the U.S. and EU may have more than a marginal impact on U.S. and EU policy-making;³⁶ however, the impact of state financial interests, such as a lack or mismanagement of public funds, may have a limited or marginal, if any, influence on EU and U.S. regional wireless enhanced emergency call services or public safety interests.³⁷ The U.S. and EU do not avoid legislative and agency policy-making simply because one or more states cannot comply for fiscal policy reasons or choose to delay compliance for political, fiscal or other reasons.³⁸ A state political or other force may signal a broader underlying problem in U.S. and EU policies or economies, which means we cannot always

34. See *infra* Part V.C and accompanying notes (discussing U.S. legislation that attempts to encourage state to implement wireless E911).

35. See *infra* Part III.A.1 and accompanying notes.

36. See *id.*

37. See *id.* One must recognize that an EU recommendation is not a ringing endorsement of federal or regional implementation. See *infra* Part IV.A and accompanying notes. Likewise, the U.S. carrot approach to induce state implementation of E911 is not strident. See *infra* Part V.C.2 and accompanying notes.

38. See *infra* Part V.B and accompanying notes (finding that Congress chose not to mandate any state fiscal obligations).

ignore the status or condition of similar state and EU or U.S. policy forces. In state policy-making, unemployment, tax, privacy, fiscal or another state force may influence state policy choices and priorities of state legislative or policy-making bodies assign to implementing a non-mandatory EU and U.S. public policy or public interest, such as public safety.³⁹ Addressing how U.S. and EU enhanced wireless emergency call services policies could be greatly influenced by a state force, such as culture, fiscal or economy, is not within the scope of this paper, but a state's delay in implementing U.S. and EU enhanced emergency services policies may deny emergency assistance to wireless subscribers.⁴⁰

B. Recognizing Conflict between Public Safety Needs and Business and Market Interests of Telecommunications in U.S. and EU Policy-Making

U.S. and EU policy-making approaches and their business impact on the telecommunication industry in establishing and implementing public safety needs involve primarily four policy-making and business concerns and their interrelationships. These concerns also involve the interrelationships among public interests and business market interests that underlie policy forces influencing or impacting government policy-making.

In this comparative analysis, the four seminal policy-making and business and market concerns are: (1) government policy-making to regulate the telecommunication industry that develops competing and incompatible WCS and ALI technologies; (2) government regulation of deployment, adoption and diffusion of ALI and WCS technologies to protect public safety; (3) the business impact of public or government policy-making, namely regulation, on the telecommunications or communications industry that is mandated to protect public safety and welfare; and (4) the business advantage of commercializing ALI technologies to support the furtherance of public obligations and corporate market objectives.⁴¹ In the interrelationship among these concerns, business interests and public needs are not inherently antagonistic in public policy-making. Legislative and agency policy-makers can establish and implement public safety and directly related telecommunication policies to provide enhanced wireless emergency call number services. At the same time, these policy-makers must minimize unmanageable or unreasonable financial, product, service and other market disadvantages that could be faced by the telecommunication industry in developing, adopting and diffusing cellular standards, location information and other technologies under public mandates.

39. See *infra* Part V.C and accompanying notes (explaining that Congress offered unfunded financial incentives to state governments that had delayed implementation of E911).

40. See Anne Marie Squeo, *Cellphone Hangup: When You Dial 911, Can Help Find You?*, THE WALL ST. J., May 12, 2005, at A1.

41. See *infra* Part III and accompanying notes (explaining the nature and structure of government, the nature and kinds of technologies and policy forces in a comparative analysis of two federated groups of states).

1. Finding a Business Market Solution in Regulating an Industry to Provide for Public Safety Needs

Mandating or obligating the telecommunication industry to develop, adopt and diffuse technologies solely to provide a public safety need furthers public policy that is often a demand of society or the public. Obviously, these EU or U.S. mandates are not corporate business objectives that will require market and financial decisions to increase profit or market share. Wireless carriers and LECs comply with enhanced wireless 911 emergency services obligations or mandates to further emergency call services policies at their own expense. However, if they can commercialize ALI and other technologies, they can offset corporate costs of development, adoption and diffusion of ALI and other technologies, especially the next generation of E112 and E911 technologies, such as video cellular phone, telematics and other devices. This market solution is not new. For example, the commercialization of caller identification (Caller ID) services by wireline carriers is too obvious to ignore. The commercialization of Caller ID by wireline carriers was a business or market interest that now has commercial value. Caller ID provides timely and accurate subscriber number identification in enhanced wireless and wireline emergency call service systems and fulfills wireless and wireline carriers' obligation to transmit the caller or subscriber's telephone number to the PSAPs.⁴²

This comparative review explores and reveals how U.S. and EU policy-making and policies deal with conflicting business, market and public interests that include commercializing location information technology and creating a workable interface among PSAPs, LECs and wireless carriers that may use different technology standards.

2. Regulating the Telecommunications Policy to further Public Safety Policies and Needs

U.S. and EU enhanced wireless emergency call number services policy-making addresses public safety needs or concerns but depends intractably on the design of telecommunication and information technology policies.⁴³ These needs are dependent on the deployment, adoption and diffusion of wireless standard, ALI and other technologies. EU and U.S. public safety needs want timely and accurate location information to assist wireless subscribers who must depend on public safety officers to find and assist them by providing emergency assistance. Public safety needs touch or overlap national security policy that relies on emergency services and assistance to deter and respond to acts of

42. See 47 C.F.R. § 20.18(d) (2006).

43. See *id.* (setting wireless technology and public safety policy for E911); see Directive 2002/22/EC, *supra* note 12 (setting EU telecommunication policies and establishing the E112).

terrorism.⁴⁴ Moreover, national security and public safety are dependent on a ubiquitous communication system and directly implicate telecommunication policy.

Public safety interests are not the only public policy that EU and U.S. policy-makers must address and implement to provide public safety needs, namely emergency services. This comparative review examines how the EU and U.S. policy-makers amend and implement telecommunication policies influencing the operations of the communication industry, including both wireline and wireless carriers.⁴⁵ EU and U.S. policy-makers directly influence

44. See 47 U.S.C. § 615. Specifically, Section 102 states: “[t]he Congress finds that— (1) for the sake of our Nation's homeland security and public safety, a universal emergency telephone number (911) that is enhanced with the most modern and state-of-the-art telecommunications capabilities possible should be available to all citizens in all regions of the Nation.” *Id.* Likewise, Recommendation 2003/558/EC recognizes the impact of telecommunication policies on public safety policy in establishing and implementing E112. Recommendation 2003/558/EC, *supra* note 12. Recommendation 2003/558/EC states that: “[h]aving regard to the Directive 2002/21/EC on a common regulatory framework for electronic communications and services (the ‘Framework Directive’) (1), and in particular Article 19 thereof,” Recommendation 2003/558/EC, *supra* note 12.

45. See Directive 2002/22/EC, *supra* note 12. The EU Commission, Council and Parliament in Directive 2002/22/EC illustrates the nature of EU telecommunication policy. *Id.* Directive 2002/22/EC states that:

Whereas:

(1) The liberalisation of the telecommunications sector and increasing competition and choice for communications services go hand in hand with parallel action to create a harmonised regulatory framework which secures the delivery of universal service. The concept of universal service should evolve to reflect advances in technology, market developments and changes in user demand. The regulatory framework established for the full liberalisation of the telecommunications market in 1998 in the Community defined the minimum scope of universal service obligations and established rules for its costing and financing.

Id. The EU is reviewing its telecommunication policies and regulation for the creation of a single market. See Communication on Regulatory Framework of Telecommunications, *supra* note 2. The European Commission seeks to review the telecommunication regulatory frameworks that have set forth the telecommunication policies of the EU single market. See *id.* Summary, 3n., citing Directives 2002/19/EC, 2002/20/EC, 2002/21/EC, 2002/22/EC (OJ L 108, 24.4.2002, p. 7) and 2002/58/EC (OJ L 201, 31.7.2002, p. 37). The Communication on Regulatory Framework of Telecommunications addresses the need to revise or change the telecommunications and information technology policies of the EU. Communication on Regulatory Framework of Telecommunications, *supra* note 2. *Id.* at 3. The European Commission states that:

Creating a single European information space with an open and competitive internal market is one of the key challenges for Europe [footnote omitted], within the broader strategy for growth and jobs. Electronic communications underpins the whole of the economy, and at EU level is supported by a regulatory framework that entered into force in 2003. The aims of the framework are to promote competition, consolidate the internal market for electronic communications and benefit consumers and users. It is designed to take account of convergence, in that it deals with markets and not technologies. Markets are defined according to competition law principles, based on general demand and

the development, adoption and diffusion of cellular standards, automatic location and other technologies necessary to implement public safety policies. Enhanced emergency call number regulatory schemes demand wireless carriers, LECs and PSAPs, to provide both the telephone number and location of wireless subscribers requesting emergency services or assistance. This comparative analysis examines how EU and U.S. policy-makers balance public safety, communication, national security and other policies in establishing and implementing enhanced wireless emergency call services by creating demands and imposing mandates on LECs, PSAPs and wireless carriers. Eventually, private and public entities must conform to or comply with state-imposed schedules to meet central government, both U.S. and EU, public safety obligations.

C. Establishing E112 and E911 Policies Under Conflicting Public Safety and Telecommunications Interests

Reviewing EU and U.S. policy guidance, policies and regulation to find similarities and differences in establishing and implementing enhanced wireless emergency number call services systems requires an analysis of the weight and influence of social, economic, political, technology and public policy forces and their underlying interests, such as public safety, privacy and technology development. Specifically, ascertaining the weight and influence includes describing the nature of these forces and their interests, examining the roles and impact of dominant interests, and weighing the likely impact of an interest on

supply side considerations, and are independent of changes in the underlying technology. The framework provides for the progressive removal of regulation as and when competition becomes effective.

Id. ¶1, Background, 3.

The telecommunications policy of the United States has undergone a recent change to reflect global and domestic changes in the telecommunication and information technologies and their respective industries. *See* Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996), (amending and repealing parts in 47 U.S.C. §§ 151 et seq.) (2006). The Telecommunications Act was a complete overhaul of the Communications Act of 1934, Pub. L. No. 73-416, § 1 48 Stat. 1064 (1934) (codified at 47 U.S.C. § 151 et seq.) (2006). Congress states that the purpose of the Telecommunication Act is “to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.” 47 U.S.C. §157. Moreover, Section 1 sets forth the purposes and policies of the Communications Act by stating:

For the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, a rapid, efficient, Nationwide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, for the purpose of promoting safety of life and property through the use of wire and radio communication, and for the purpose of securing a more effective execution of this policy by centralizing authority. . . .

47 U.S.C. § 251 (2006).

public safety and technology development and business and market growth. This analysis or review of legislative acts, administrative regulations and policy guidance and business development and commercial markets requires business, legal and policy analytics.

1. Policy Making and Setting Objectives for the Public Interests and National Competition

Public policy approaches and objective setting recognize public safety needs and other interests and decide whether to establish and implement legislative policies and acts and create agency regulations to further the interests underlying these policies and acts.⁴⁶ Legislative or policy objectives recognize a public interest and its importance, nature and state.⁴⁷ Once legislative findings show sufficient harm or a substantial enough threat to an important public interest, such as public safety or access to emergency care, the legislature establishes objectives and enacts legislation to protect this interest.⁴⁸ Public policy objectives justify the need to protect one or more public interests, such as safety, privacy or domestic competition, by regulating behavior or conduct of wireless carriers and location-based services providers.⁴⁹ These objectives justify legislation and agency regulations⁵⁰ that resolve policy conflicts existing among competing public interests, such as protecting wireless subscribers and preserving competition among wireless carriers, by giving greater weight to or protecting one or more public interests in a regulatory scheme.⁵¹

Judicial and legislative conflict between public needs arises when wireless carriers do not want to pass on to subscribers the administrative, research and implementation costs of developing, deploying and diffusing newer technologies needed solely to implement emergency wireless call

46. See Directive 2002/22/EC, *supra* note 12 (recognizing the nature of the EU telecommunication and public safety services policy environments for E112 policy-making); See 47 U.S.C. § 251 (2006)(recognizing the nature of US telecommunication and public safety policy environments for establishing E911 policy-making).

47. See Directive 2002/22/EC, *supra* note 12 (setting forth purposes to provide universal service and create a harmonized regulatory environment in the EU); See 47 U.S.C. § 251 (setting forth purposes to provide for public safety and national defense and establish universal services in the US).

48. See 47 U.S.C. § 615 (2006)(setting forth US national needs for the development of wireless emergency call services); see *infra* Parts V and accompanying notes (discussing US or federal policies and regulation establishing wireless emergency call services).

49. See 47 U.S.C. § 942 (2006) notes (listing the purposes of Ensuring Needed Help Arrives Near Callers Employing [ENHANCE] 911 Act of 2004, Pub. L. No. 108-494, Title I, 118 Stat. 3986 (codified at scattered parts of 47 U.S.C.)).

50. See 47 U.S.C. § 942 (2006) notes; see *infra* Part IV.B and accompanying notes (examining and explaining the Enhanced 911 Act of 2004).

51. See *In re Revision of the Comm'n's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Sys.*, 12 FCC Rcd 22665, ¶5 & 123 (1997) (hereinafter *In re Revision*, 12 FCC Rcd) (establishing emergency call services but promoting technology neutral standards in regulatory scheme to avoid interference with competition).

services.⁵² In managing competing public interests, public policy-making must address policy conflicts that impact development, deployment and diffusion of telecommunications technologies and effect managerial, market and financial stability of wireless carriers that are quintessential in establishing and implementing enhanced wireless emergency call services or other public interests.⁵³ Legislative acts and agency regulations are either supportive or restrictive of business market interests that include the entry, growth, profitability and sustainability of an industry, market or technology, such as location information or acquisition technologies. Therefore, the public policy approach includes justifying and weighing competing and conflicting public interests and then enacting voluntary or mandatory public safety and telecommunications legislation that obligates business organizations and imposes restraints on market activities.⁵⁴

2. *Business and Markets and Setting Objectives for Business and Technology Development*

The business-market approach and objective setting include the impact of public safety interests and regulation on the commerce or business and markets of wireless carriers and telecommunications industry.⁵⁵ Legislative acts and agency regulations impose public obligations on LECs, wireless carriers and operators, as well as automatic location and other services. Yet, LECs, wireless carriers and PSAPs rely on telecommunications, information and information management technologies of the telecommunications industries.

If legislative and regulatory policy-makers weigh favorably how new obligations impact American business and market needs, the imposition of public safety, namely E911 or E112, obligations may leave wireless carriers in the telecommunications industry more discretion to manage the development, deployment and diffusion of wireless, location information and other technology.⁵⁶ These obligations can affect how wireless carriers, location-based services or telecommunication businesses: (1) develop new information and telecommunications technologies; (2) meet competition in domestic product and service markets; (3) meet the competition of global inventors and producers of telecommunications products and services; and (4) adapt to the market, financial and other regulatory burdens of implementing enhanced wireless

52. See *U.S. Cellular Corp. v. FCC*, 254 F.3d 78, 86 (D.C. Cir. 2001) (rejecting to force the FCC to impose a cost recovery mechanism).

53. See *infra* Parts IV, V, and accompanying notes (discussing EU and U.S. public policy-making for enhanced emergency call services and its business impact).

54. See *id.*

55. See *infra* Part III.B and accompanying notes (discussing cellular standards and ALI technologies used by wireless carriers that must connect to the emergency call services systems).

56. See *infra* Part IV and accompanying notes (discussing EU wireless enhanced emergency call services policies that permit wireless carrier to use existing technologies while developing and commercializing new technologies).

emergency call services systems.⁵⁷ Normally, public safety and telecommunications policies and regulation govern business and markets to effect the development, deployment and diffusion of telecommunications and information technologies.⁵⁸

The impact of regulation on wireless cellular, location and other telecommunications services implicates business and market interests that are business-market concerns. These concerns arise when business organizations and the telecommunications industry must commercialize location and other technologies already subject to stringent public obligations, compete globally with competitors subject to fewer obligations in the global market, execute corporate business strategies subject to new public needs and regulation and adapt to the financial impact of new policies and regulation on market and business performances to provide public benefits.⁵⁹ Business and market policy concerns show limits or restraints on business performance and markets caused by mandates that can (1) create entry hurdles for new domestic competitors that must meet the obligations of new regulation, (2) reduce the ability or survival of domestic competitors competing in a global market, (3) curtail the development and eventual growth of services and products by imposing heavy public costs and benefits and (4) dampen business growth and market performance that delay the deployment and diffusion of new wireless and other technologies. These restraints and limitations mean that business and market interests underlying both E112 and E911 can antagonize and conflict with public interests under U.S. and EU policy-making.

The comparative analysis used to contrast and compare U.S. and EU enhanced wireless emergency services systems rely on a business market-public policy analytical framework.⁶⁰ In this framework, this combination of business, legal and policy analytics find, examine and explain U.S. and EU policy-making forces and examine or evaluate underlying force-specific public interests and business and market concerns. In fact, one or more public interests or business interests exert, jointly or singly, a dominant influence on the design and implementation of U.S. and EU policy guidance, policy and regulation to establish and implement enhanced wireless emergency call number services systems, namely E112 and E911.

57. *See infra* Parts IV, V, and accompanying notes (discussing economic objectives of EU and U.S. policy-making for wireless enhanced emergency call services policies).

58. *See infra* Parts IV, V, and accompanying notes (discussing the EU and U.S. enhance wireless emergency number call system mandates on wireless carriers and operators).

59. *See id.*

60. *See supra* Part I.C. and accompanying notes (combining business, market, and public policy analytics to create a business market-public policy approach to examine and explain dissimilar forms of EU and U.S. policy guidance, policies, and regulation).

III. NATURE OF POLICY-MAKING, TECHNOLOGIES AND ANALYTICS OF REVIEWING U.S. AND EU EMERGENCY CALL NUMBER SYSTEMS

This comparative analysis focuses on the development of public policy that culminates in mandatory or voluntary obligations in enhanced wireless emergency call number services systems. The comparative analysis must consider the nature of U.S. and EU government policy-making and the U.S. and EU state of telecommunication technologies. The comparative analysis relies on an analytical framework to recognize, find and examine economic, social, political, technological and public policy forces and their underlying interests of the U.S. and EU. Of these policy forces, technology and politics may play the more dominant roles. Specifically, the nature of EU and U.S. political or policy-making structures determines or greatly affects the choice of policies, regulation and state guidance establishing and implementing both mandates and voluntary obligations for emergency call services. In addition, the state of U.S. and EU telecommunications industries or technologies greatly determines the availability of cellular and ALI technologies to wireless subscribers and PSAPs and also affects the accessibility of PSAPs and LECs to wireless carriers' location information. The nature of policy-making and state of technologies play major roles in establishing and implementing public safety, telecommunications, information technology and other policies.

A. *The Nature of EU and U.S. Public Policy-Making and Law-Making*

The EU and the U.S. use different political systems to establish and implement enhanced wireless emergency call number services systems under state emergency call services policies, incompatible cellular standards and different location technologies. In these political or governmental systems, the EU and U.S. central governments share powers with their respective states,⁶¹

61. See U.S. CONST. amend. X. The Tenth of Amendment of the United States Constitution states that all powers not delegated to the Federal government are reserved by people or states. *Id.*

The EU Constitution has not been approved by a majority of member states. Economist, *Survey: Constitutional Conundrum*, June 17, 2007, 9 (stating that voters in France and the Netherlands may have temporarily stopped any efforts of creating an EU constitution). The EU was created and presently operates under treaties. See Treaty Establishing the European Community (Nice Consolidated Version), Official Journal C 325, 24/12/2002 P. 0033 – 0184 or Official Journal C 340, 10/11/199 Consolidated version (hereinafter Treaty Establishing EU). The Treaty Establishing the EU delegates powers to EU institutions, namely the European Commission, Parliament, and Council. *Id.*

EU members tried to amend the Treaty Establishing the EU by adopting and ratifying the EU Treaty of Lisbon in December 2007. See Treaty on the Functioning of the European Union, Amending the Treaty on European Union and The Treaty Establishing the European Community, OFFICIAL JOURNAL OF THE EUROPEAN UNION, 2007/C306/010 (December 12, 2007)(hereafter Treaty on the Functioning of the EU). On June 12, 2008 or thereabout, 18 of the 27 EU members had ratified the Treaty on the Functioning of the EU when Irish voters

and thus do not always have authority to issue mandates on all policy-making matters and instead must often issue policy guidance aimed at encouraging states to establish and implement policies.

1. *EU Policy Guidance and Substantive Policy and Regulation*

The nature and types of substantive law and policy guidance enacted by the European Union Commission, Parliament and Council⁶² reveal the nature and use of EU policy-making to establish and implement public policy by regulation, policy and policy guidance in member states.⁶³ EU legislative actions include three kinds of law and one type of policy guidance, and thus EU lawmaking has varying degrees of coverage and enforceability in establishing and implementing EU legislative policies.⁶⁴ First, EU regulations are mandates with the force of law. are binding on all member states.⁶⁵ No transformation of the EU regulation into national law is necessary as a prerequisite for its applicability. By contrast, the second form of EU legislative action, the EU directive, requires member states to engage in legislative actions to implement

voted not to ratify this treaty. *World News: European Union Softens Stance on Ireland Over Treaty Rejection; Conciliatory Sarkozy Sees No Need For Two-Tier Bloc*, WALL ST. J., Jun. 17, 2008, pg. A13

62. See, e.g., EUROPEAN UNION COMMISSION DELEGATION TO THE UNITED STATES, THE EUROPEAN UNION: A GUIDE FOR ALL AMERICANS 6-9, <http://www.eurunion.org/infores/euguide/euguide2008.pdf>, (last visited on Apr. 15, 2008)(hereinafter EU Guide). "Legislation is drafted by the Commission and requires approval by the Council and, in most cases, the Parliament. The Commission considers legislation only when it believes an EU-level remedy is necessary for a problem that cannot be solved by national or local governments." *Id.* at 9. The EU Commission drafts laws or regulations, which is one form of EU legislation. *Id.* The EU Parliament and Council must approve these laws or regulations, which that are legislative bodies of the EU Community. *Id.* They enact the laws, decisions, and directives and can provide policy guidance for member states by recommendations. *Id.*

63. See Treaty Establishing EU, *supra* note 61, at Part V, Title I, Section I, Art. 249, c. 2. Article 249 of the Treaty Establishing EU states that "[i]n order to carry out their task and in accordance with the provisions of this Treaty, the European Parliament acting jointly with the Council, the Council and the Commission shall make regulations and issue directives, take decisions, make recommendations or deliver opinions." *Id.* Although the Treaty on the Functioning of the E U has not been ratified by all EU members, it would have amended pertinent sections or parts of Art. 249. Treaty on the Functioning of the EU, *supra* note 61, at 2007/C306/113. One amendment states that :

235) Article 249 shall be amended as follows:

(a) the first paragraph shall be replaced by the following:

'To exercise the Union's competences, the institutions shall adopt regulations, directives, decisions, recommendations and opinions.';

...

Treaty on the Functioning of the EU, *supra* note 61, at 2007/C306/113,

64. See Treaty Establishing EU, *supra* note 61, at Art 249; see also EU Guide, *supra* note 61; and see VAN GERVEN, *supra* note 19, at 12-18.

65. Treaty Establishing EU, *supra* note 61, at Art 249.

its policies.⁶⁶ EU directives set forth particular EU policies or public objectives that must be transposed into national law to become effective. Member states are obligated to take the necessary legislative actions to ensure that national law is in compliance with the mandates of the directive by the deadline specified in the directive.⁶⁷ Within the framework set forth in the directive, member states are, however, at liberty to exercise discretion and own judgment in determining how to implement the directive into national law. EU directives are often the approach of choice to harmonize conflicting national laws. EU regulations, by contrast, lead to a convergence of national laws towards one pan-European legal standard.

Third, EU decisions are particular mandates with the force of law addressed to member states or organizations and individuals.⁶⁸ Thus, like

66. *Id.*

67. *Id.* If a member states fail to implement a directive into national law by the specified date, the European Commission will initiate legal proceedings against the member state before the European Court of Justice generally resulting in fines being imposed on the member state. See VAN GERVEN, *supra* note 19, at 27 & n.79 ("On the Community courts, and various procedures that can be initiated before them, see Articles 22-45 EC [Treaty] . . . VAN GERVEN, *supra* note 19, at 27 n.79). In addition, the directive is frequently treated as having direct applicability after the transposition date has passed; i.e., citizens can claim rights conferred upon them by the directive even if their home state has failed to adopt it. In this respect, EU directives upon passage of the implementation deadline often become similar to EU regulations. See also VAN GERVEN, *supra* note 19, at 27-28 (discussing the powers of the European Court of Justice to resolve disputes between EU institutions and member states and EU citizens and national states). Details of the doctrine of direct applicability of EU directives are complex and beyond the scope of the brief summary that can be provided in this Article.

68. Treaty Establishing EU, *supra* note 61., at Art 249; see Treaty Establishing EU, *supra* note 61, art. 256. Article 256 of the Treaty Establishing EU states that:

Decisions of the Council or of the Commission which impose a pecuniary obligation on persons other than States, shall be enforceable. Enforcement shall be governed by the rules of civil procedure in force in the State in the territory of which it is carried out. The order for its enforcement shall be appended to the decision, without other formality than verification of the authenticity of the decision, by the national authority which the government of each Member State shall designate for this purpose and shall make known to the Commission and to the Court of Justice.

Treaty Establishing EU, *supra* note 61, art. 256. The Treaty of the Functioning of the EU would have amended pertinent a part of Article 249 of the Treating Establishing EU., Treaty of the Functioning of the EU, *supra* note 61, at 2007/C360/113. The amendment states that:

235) Article 249 shall be amended as follows:

(b) the fourth paragraph shall be replaced by the following:

'A decision shall be binding in its entirety. A decision which specifies those to whom it is addressed shall be binding only on them.'

...

Treaty of the Functioning of the EU, *supra* note 61, at 2007/C360/113.

regulations, EU decisions are binding and do not require member states to engage in legislative actions. However, unlike regulations and directives, EU decisions lack general applicability and are only binding upon those to whom they are addressed. Moreover, the EU Parliament and Council can provide policy guidance⁶⁹ to member states by issuing EU recommendations and opinions. EU recommendations and opinions are not binding on member states but set forth policy objectives that member states should consider in developing national policies, objectives and priorities.⁷⁰ As recommendations and opinions reflect the EU's position on the subject, recommendations and opinions often serve as important indicators for the EU's future course of action. In concluding, the EU Commission and Parliament and Council impose mandates, set forth voluntary obligations and provide policy guidance to member states.⁷¹ Part IV reviews the nature and force of major EU legislative regulation, directives, decisions and policy guidance to establish and implement EU policy and law for enhanced wireless emergency call services.

2. U.S. Policy Guidance and Substantive Policy and Regulation

The nature and types of U.S. legislative laws and policy guidance enacted by Congress and promulgated by federal agencies⁷² reveal the nature and use of U.S. policy-making to establish and implement public safety and telecommunication policies.⁷³ The U.S. government is federalist, dividing power between states and federal or central government⁷⁴ and dividing the federal powers among branches of the central government.⁷⁵ U.S. federalism permits each state to develop a public policy that could be substantively different from federal policies and implemented at an entirely different pace.⁷⁶ In the Constitution, Congress is the federal legislature and enacts legislation

69. *Id.* State policy guidance is provided by the legislative body of the EU and U.S. central governments. However, legislative or policy guidance is not binding or forceful and, thus, cannot be enforced by an executive agency or body. Policy guidance identifies a particular U.S. or EU policy, such as enhanced wireless emergency call services. This guidance often sets forth public needs, objectives, and benefits of a particular EU or U.S. state. *See* 47 U.S.C. § 615 (2006); Recommendation 2003/558/EC, *supra* note 12. However, policy guidance purposely encourages states to establish and implement a policy program. *See* 47 U.S.C. § 615 (2006); Recommendation 2003/558/EC, *supra* note 12. The EU and the United States pass policy guidance to encourage states to implement a central government policy when the EU or U.S. legislative body does not possess constitutional or governing authority to impose mandates on the states.

70. Treaty Establishing EU, *supra* note 61, art. 256.

71. *Id.*

72. *See* U.S. CONST. art. I (enumerating the powers Congress can exercise to make law and policy).

73. *See infra* Part IV and accompanying notes.

74. *See* U.S. CONST. amend. X.

75. *See* U.S. CONST. arts. I, II, & III (enumerating that the people of Congress to make law and public policy).

76. Treaty Establishing EU, *supra* note 61, at Art 249; U.S. CONST. amend. X.

establishing federal policies⁷⁷ and implementing federal policy by statutes, such as the Communications Act of 1934.⁷⁸ Congress uses specific legislative powers, such as the Commerce Clause,⁷⁹ to implement federal policies, such as telecommunication policy.⁸⁰ Congress also has standing legislative committees that conduct investigative hearings on public policy concerns and government matters within their authority, including telecommunications.⁸¹ These committees prepare and issue hearing reports that often consist of findings, recommendations and proposals on legislations.⁸² Committees often refer bills, proposed legislation, to the House of Representatives or Senate for floor debate and voting.⁸³ Legislative acts or statutes establish federal policy and impose obligations or mandates on corporations⁸⁴ and state governments when

77. See U.S. CONST. art. I.

78. 47 U.S.C. § 615 *et seq.* (2005).

79. U.S. CONST. art. VIII, cl. 1.

80. See Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56; Communications Act of 1934, Pub. L. No. 73-416, § 1, 48 Stat. 1064, 1064.

81. See, e.g., *The EU Constitution and U.S. and U.S.-EU Relations: The Recent Referenda in France and The Netherlands and the U.S.-E.U Summit: Hearing Before the Subcomm. on Europe and Emerging Threats of the Comm. on International Relations*, 100th Cong., 1st Sess., 1, (June 22, 2005)(hereinafter U.S.-E.U. Relations); *U.S.-E.U. Regulatory Cooperation on Emerging Technologies: Hearing before the Subcomm. on European Affairs of the Comm. on Foreign Relations*, 100th Cong., 1st Sess., 1, (May 1, 2005)(hereinafter U.S.-E.U. Regulatory Cooperation).

82. See U.S.-E.U. Relations, *supra* note 81, at 2. A congressional hearing was conducted to assess the impact of the rejection of the EU Constitution by French and Dutch voters on US reliance on EU support of counterterrorism and peace initiatives. The Honorable Elton Gallegly, Representative from California and Chairman, Subcommittee on Europe and Emerging Threats, describes events leading up to the hearing. *Id.* Representative Gallegly states that:

At the U.S.-EU Summit on Monday, European leaders sought to reassure the President that the recent constitutional turmoil would not stop the EU from playing a strong role on important issues such as Iraq, Iran, the Middle East peace process and counterterrorism.

Considering all these issues, and all that has happened in the past month, the Subcommittee has invited our two distinguished witnesses, Ambassador Conzemius and Ambassador Bruton, to discuss these developments and to perhaps shed some light on what we expect the future may hold.

Id.

83. See H.R. 3403, 110th Cong., 1st Sess. (2007), H.R. 3403 was introduced by Mr. Gordon of Tennessee and referred to the Committee on Energy and Commerce. *Id.* The objectives of H.R. 3403 are “to promote and enhance public safety by facilitating the rapid deployment of IP-enabled 911 and E-911 services, encouraging the nation’s transition to a national IP enabled emergency network and improve 911 and E-911 access to those with disabilities.” *Id.* This proposed legislation would be referred to as the “911 Modernization and Public Safety Act of 2007” *Id.*

84. 47 U.S.C. §§ 151 *et seq.* (2005). Congress enacted the Federal Communications Act to govern the telecommunication industry. *Id.*

constitutional authority permits Congress to impose obligations on the states.⁸⁵ Congress may choose to preempt state law in the same field as federal law, such as telecommunications.⁸⁶

If Congress cannot or chooses not to impose mandates on state governments, then federal legislative acts or statutes merely encourage U.S. states to comply with federal policy and thus may be no more than federal policy guidance.⁸⁷ Moreover, U.S. legislative acts or statutes also create U.S. administrative agencies, such as the Federal Communications Commission⁸⁸ (FCC), that implement U.S. telecommunication and communications policies by conducting investigations, conducting hearings and making regulations.⁸⁹ Part IV reviews the nature and force of major U.S. legislative acts and administrative regulations establishing and implementing U.S. policy and law regulating enhanced wireless emergency call services and telecommunications.

B. Nature of Wireless Cellular Standards and Automatic Location Technologies

In the U.S. and EU, tens of millions of wireless subscribers make millions of wireless emergency calls.⁹⁰ Wireless carriers deploy different wireless cellular standards so that wireless subscribers do not use the same wireless cellular technology to call PSAPs that will need different equipment or technologies to receive emergency calls transmitted to it by LECs. PSAPs and LECs are public and private entities, respectively, in the enhanced wireless emergency services system. The PSAPs are public agencies operated by law enforcement or emergency personnel and contain communication and location equipment necessary to receive wireless emergency calls.⁹¹ PSAPs provide

85. See U.S. CONST. amend XI.

86. 47 U.S.C. § 414 (2006). The Federal Communications Act provides “except that this paragraph shall not prohibit a State from regulating the other terms and conditions of commercial mobile services.” See 47 U.S.C. § 414

87. See 47 U.S.C. § 615 (2006).

88. 47 U.S.C. § 151 (2006). The Federal Communications Act creates the Federal Communications Commission (FCC). *Id.* The FCC shall “make available . . . a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges . . .” 47 U.S.C. § 151 (1994).

89. 47 U.S.C. § 303 (1997). The FCC is also invested with rulemaking and other functions to implement federal telecommunications policies. See 47 U.S.C. § 303 (1997). The FCC has the authority to regulate mobile services. 47 U.S.C. § 332(a) (2002).

90. *Id.* In the United States, roughly 68 million Americans subscribed to a wireless telephone service in 1999. *Id.* at 57 (citing 145 Cong. Rec. H728, 732 (daily ed. Feb. 24, 1999) (statement of Rep. Green)). These subscribers placed 43 million wireless 911 calls that year — double the amount of similar calls made in 1996 — and in 2001. Moreover, the experts predict the total number of cellular calls placed in the United States will exceed all wireline calls. *Id.*

91. *Id.* “PSAPs are inundated with more than eighty calls per minute, and fueled by the explosion in the number of cellular subscribers, an exponentially increasing number of these calls are placed from wireless phones.” *Id.* at 57 (citing 145 Cong. Rec. H728, 733 (daily ed. Feb. 24, 1999) (statement of Rep. Green; Comm’r Gloria Tristani, Address at the Association of

emergency assistance by dispatching and directing emergency services to the locations of the callers.⁹² PSAPs need location information that may not be automatically provided by wireless carriers. Finally, PSAPs receive calls from the wireless subscribers whose calls are transmitted through the LECs. LECs are local wireline carriers that own switching and signaling equipment that recognizes and relays the emergency calls to the PSAPs.⁹³ LECs route emergency calls to the appropriate PSAPs.⁹⁴ Unlike emergency calls made from wireline telephones, the precise location of wireless subscribers or emergency callers who are using cellular and mobile telephones is not as readily known by PSAPs.⁹⁵ In retrieving location information, the PSAPs must ask wireless subscribers to give their specific location.⁹⁶ Asking for location information during an emergency may often cause PSAPs to lose extremely valuable or precious time in dispatching emergency services or assistance.⁹⁷

1. Overview of Location and Cellular Technologies Available to the U.S. and EU

New ALI technology is capable of providing high accuracy location information for cellular or mobile telephones,⁹⁸ thus providing the technology to meet EU and U.S. enhanced wireless emergency call services mandates of wireless carriers.⁹⁹ In fact, ALI technology includes networks and handsets.¹⁰⁰ Hybrid systems also exist, such as Enhanced Observed Time Difference (E-OTD). They combine network and handset-based systems.¹⁰¹ Handset-based location relies on the Global Positioning System (GPS).¹⁰² GPS is a space-based radio navigation system consisting of twenty four earth-orbiting satellites that provide three-dimensional position and velocity.¹⁰³ The location coordinates are determined by satellite position relative to the center of the earth.¹⁰⁴ For optimal results, a user must have three or, preferably, four satellites within line of sight to ascertain location.¹⁰⁵ A chip embedded in the

Pub. Safety Comm. Officials-Int'l (Aug. 14, 2000).

92. Ten Eyck, *supra* note 3, at 56-57. See Revision of the Comm'n's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Report and Order and Further Notice of Proposed Rulemaking, 11 F.C.C.R. 18676, 18679 (FCC 1996) [hereinafter 1996 FCC Report].

93. Ten Eyck, *supra* note 3, at 56-57.

94. Implementation of 911 Act, 15 F.C.C.R. 17079 (Fed. Comm'n Comm. 2000) [hereinafter 911 Act Report and Order]; 1996 FCC Report, *supra* note 93, ¶ 3.

95. See CGALIES Report, *supra* note 11, at 7; Hatfield, *supra* note 11, at 3.

96. See 1996 FCC Report, *supra* note 95.

97. See CGALIES Report, *supra* note 11, at 7; Hatfield, *supra* note 11, at 3.

98. See CGALIES Report, *supra* note 11, at 28; Hatfield, *supra* note 11, at 11.

99. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 11.

100. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 10.

101. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 11.

102. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 10.

103. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 10-11.

104. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 3.

105. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 3.

wireless phone receives signals from three or more satellites and calculates the location.¹⁰⁶

Next, network-based techniques locate cell phone calls by not requiring handset modification.¹⁰⁷ Network-based location techniques typically use some type of triangulation.¹⁰⁸ Based on the known speed of radio signals, the distance from receivers can be calculated.¹⁰⁹ Several network-based location solutions are in use, under development or in testing. These include Cell of Origin, Angle of Arrival (AOA), Time Difference of Arrival (TDOA) and Radio Frequency (RF) Fingerprinting.¹¹⁰ One of these location technologies must work with one or more wireless cellular standards to provide location information for a wireless subscriber.¹¹¹ However, the implementation of ALI for eventual use by PSAPs or emergency call services centers has been, and still is, a complex challenge to the wireless carriers or mobile telephone operators who must provide the location information to telecom operators or LECs who, in turn, must transmit the location information to PSAPs, which must receive and use the information to provide emergency services.¹¹²

The availability of several wireless cellular standards also complicates the implementation of enhanced wireless emergency call services systems because each PSAP must support the interface with the cellular standard and automatic location technologies.¹¹³ The three major digital technologies are (1) Time Division Multiple Access (TDMA), (2) Code Division Multiple Access (CDMA) and (3) Global System for Mobile Communications (GSM).¹¹⁴ First, TDMA divides each cellular channel into three time slots in order to increase the amount of data that can be carried. TDMA is used by multiple cellular telephone systems throughout the world; however, each of these systems implements TDMA in a somewhat different and often incompatible way.¹¹⁵ Second, CDMA takes the entire allocated frequency range for a given service and multiplexes information for all users across the spectrum range at the same time. With CDMA, signals are broken into small, digitized segments and encoded to identify each call. CDMA allows numerous signals to occupy a single transmission channel thereby optimizing the available bandwidth.¹¹⁶

106. See CGALIES Report, *supra* note 11, at 28-29; see also Hatfield, *supra* note 11, at 3; and see ERIC KNOR, M-BUSINESS GUIDE TO LOCATION, M-Business 66-79 (2001).

107. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 10.

108. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 10.

109. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 10.

110. See CGALIES Report, *supra* note 11, at 28-29; Hatfield, *supra* note 11, at 3.

111. See CGALIES Report, *supra* note 11, at 28-29.

112. See Hatfield, *supra* note 11, at 19; GCALIES, *supra* note 11, at 28.

113. See GCALIES Report, *supra* note 11, at 29.

114. See *id.* at 28-29.

115. Ivy Yvonne Kelly, *The Multipath Fingerprint Method for Wireless E-911 Location Finding* 16 (May 2000), (unpublished doctoral dissertation, Univ. of Texas, Austin) (on file with author).

116. M. D. Milnes, *Wireless Telephony: Cellular, PCS, and MSS*, in COMMUNICATION TECHNOLOGY UPDATE, 51-84 (August E. Grant & Jennifer H. Meadows eds, 6th ed., 2000).

Third, GSM employs a form of time division access. Time Division Multiplexing (TDM) is used in GSM on each frequency channel to divide the channel into time slots.¹¹⁷ GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot.¹¹⁸ Presently, the dominant digital wireless technology in the cellular or mobile phone market is GSM.¹¹⁹

2. *Telecommunications Technologies, Business and Markets*

Wireless telephone and ALI technology manufacturers, distributors and sellers are a part of the telecommunications industry that includes business development and markets.¹²⁰ They also deploy new telecommunication technologies and equipment to increase their domestic and foreign competitiveness in geographic and product markets, such as cellular and location information-based services.¹²¹ Emerging wireless technologies will speed the transmission of voice, data and other services by wireless carriers and location services operators.¹²² As PSAPs interface with LECs to route several

117. *Id.* at 51-84.

118. Christopher Drane, Malcolm Macnaughtan, & Craig Scott, *Positioning GSM Telephones*, IEEE COMM. MAG., at 46-54 (April 1998).

119. *Id.* at 46.

120. *See, e.g.*, United States Department of Labor, Telecommunications: Nature of the Industry, at <http://www.bls.gov/oco/cg/cgs020.htm#outlook> (last visited Apr. 15, 2008) [hereinafter USDOL-Nature of Telecommunications]. "The telecommunications industry is at the forefront of the information age—delivering voice, data, graphics and video at ever increasing speeds and in an increasing number of ways." *Id.*

121. *Id.* Although the United States Department of Labor provides the information for career or occupational purposes, this labor information shows the dynamics of the telecommunications industry, including wireless telecommunications:

[w]ireless telecommunications carriers are deploying several new technologies to allow faster data transmission and better Internet access that should make them competitive with wireline carriers. One technology is called third generation (3G) wireless access. With this technology, wireless carriers plan to sell music, videos, and other exclusive content that can be downloaded and played on phones designed for 3G technology. Wireless carriers are developing the next generation of technologies that will surpass 3G with even faster data transmission. Another technology is called "fixed wireless service," which involves connecting the telephone and/or Internet wiring system in a home or business to an antenna, instead of a telephone line. The replacement of landlines with cellular service should become increasingly common because advances in wireless systems will provide data transmission speeds comparable to broadband landline systems.

Id.

122. *Id.* *See also* TELECOMMUNICATIONS INDUSTRY ASSOCIATION, 2005 ANNUAL REPORT (2005) [hereinafter TIA-Annual Report]. TIA "is a respected advocate for public policies that promote competition, innovation and investment, and that foster a climate conducive to the continued emergence of new communications technologies." *Id.* TIA also addresses public policy concerns directly and indirectly impacting emergency call services systems and their operations. *See id.* at 10-11. "TIA . . . focuse[s] on federal funding for interoperability of

wireless cellular standards, a technological policy concern may arise regarding the ability of new businesses to enter into wireless or cellular markets. In giving preference to the dominant cellular or ALI technology, both EU and U.S. policy-makers may impact the ability of new and old mobile operators or wireless carriers to develop, deploy and diffuse emerging technologies based on entry to new geographic and product markets where these organizations want to acquire a favorable market share and profits.¹²³ However, competition among competing cellular technologies forces PSAPs and LECs or telecom operators to interface at the state's expense.¹²⁴ Thus, EU and U.S. telecommunications policy-making for wireless cellular standards only becomes more complex with the addition of telecommunications policy-making for automatic location methods when both location information and wireless services are provided by two or more competing technologies, commercialized in one or more business markets, and impacted by one or more government policies, such as public safety and national security. Unraveling these complexities of government policies and their business and technological impacts requires analytics to find and examine similarities and differences between unique U.S. and EU policies and laws for establishing and implementing enhanced wireless emergency number call systems.

C. Analytics for Reviewing E112 and E911 under Telecommunications and Public Safety Policies of the EU and U.S.

Parts III and V point out the policy-making forces in the United States and the EU. Part VI includes the comparative review of implementing and establishing E112 and E911 systems underlying public safety, telecommunications, privacy and other policies. Against the backdrop of Parts III and V and a better understanding of Part VI, this section sets forth analytics for the comparative review conducted in Part VI. Readers may understand the policy-making breadth, business development and market complexities of public and private decision-making to establish and implement E112 and E911. The analytics of Part VI rely on legislative findings, objectives and laws that have resolved both public safety and other policy concerns and addressed business and market concerns among subscribers, industry and government. These analytics identify and examine dominant policy forces and then identify and weigh their most pertinent or influential force-specific interests in establishing and implementing E911 and E112.¹²⁵ EU and U.S. policy

public safety equipment and networks, Enhanced 911 (E911) and homeland security/critical infrastructure protection/network security and reliability." *Id.*

123. Drane, Macnaughtan, & Scott, *supra* note 120, at 46.

124. See CGALIES Report, *supra* note 11, at 29. CGALIES also discussed the commercialization of information technology in EU. See *id.* at 31.

125. See Oliver Paul Morandini, *Urgent Need for Move to Political Agenda: 112: European Emergency Telecommunications*, EUR. J. OF NAVIGATION 1, 2-3 (2005) (finding the implementation of E112 to be quite erratic in examining "the challenges linked to communication between citizen and emergency service[s]" (internal citations omitted)). See,

environments consist of politics (process), economics, social forces, technology and public policy (direction). These environmental or policy forces effect or shape the design of policy guidance, policy and regulation to address specific public and business interests in deciding the outcome of force-specific problems and concerns, such as providing emergency assistance to wireless subscribers. This comparative analytical framework of business, markets and policy and regulation contains macro and micro analytics to contrast and compare EU and U.S. policy guidance, policies and regulation.

1. Macro-Analytical Criteria of an Environmental Analysis of Forces Shaping Regulation and Effecting Commerce

Societal or environmental forces and their most pertinent interests are macro-analytic tools in conducting or performing a comparative analytical review of the design, creation and implementation of an enhanced wireless emergency number call system and its regulatory schemes. The macro-analysis relies primarily on legislative findings and substance,¹²⁶ business and industry information and findings,¹²⁷ and legal and public policy information and commentaries.¹²⁸ There are five societal and environmental policy-making forces that contain conflicting and competing interests and can substantially influence the design of legislative policies and regulation of government policy-making and impact business plans and market growth. These environmental forces include public and private interests that have had and still are having a varied impact on U.S. and EU legislative policies and regulation for E911 and E112, respectively.¹²⁹

The environmental forces and their interests can be divided in several groups to show their impact within the society and on commerce and policy-making. The first grouping includes the nature of governmental efforts to protect public interests, govern private relationships and maintain continuity and stability in society. The political force and its interests include, among others, legislative policy-making to further public interests; the legal restrictions on market practices; addressing emerging public policy concerns; agency regulation of business relationships; and the legal protection of substantial business and other private interests.¹³⁰ Next, the public policy force and its

e.g., James E. Holloway et al., *Regulation and Public Policy in the Full Deployment of the Enhanced Emergency Call System (E-911) and Their Influence on Wireless Cellular and Other Technologies*, 12 B. U. J. OF SCI. & TECH. L. 93 (2006) [hereinafter E-911 Regulation] (examining federal policies, statutes and regulations governing the implementation of E911).

126. See *infra* Parts IV, V and accompanying notes (discussing the findings, purposes, and substance of U.S. and EU policies and laws on E911 and E112).

127. See *supra* Part III.B and accompanying notes (discussing the types of cellular standards and automatic location technologies in the EU and the United States).

128. See, *e.g.*, Holloway, et al., *supra* note 127; Squeo, *supra* note 1; Ten Eyck, *supra* note 3; CGALIES, *supra* note 11.

129. See *supra* Part III and accompanying notes (discussing EU and U.S. policy-making processes and policies).

130. See *supra* Parts II.A, III.A and accompanying notes (discussing public interests and

interests include, among others, the state of protecting and furthering particular public interests; the consideration, weight and priority assigned to particular environmental or policy forces and their respective interests; the impact of cultural differences on regional policies; recognition and protection of a threatened public interest; responsiveness of policy-makers to the demand of public policy concerns; and the public recognition of commerce and its interests in the regulatory schemes.¹³¹

The second grouping includes the nature of commerce or business and markets and their influence and impact on the industrial and commercial development of technologies, products and services. The economic force and its interests include, among others, the nature of the industry and its markets; the diffusion and marketing of new technologies; the state of interstate domestic competition; the capability to compete in global technology and services; the state and development of current technology; the cost of developing and implementing new technology for public needs; the responsiveness of business decision-makers to new public obligations; the ability of key industries to sustain themselves in the global marketplace; and the state of current and future business and market conditions.¹³² Next, the technology or industry force and its interests include, among others, the rate of the development of new technology; the development and deployment of new technologies; the interoperability of telecommunication technologies; compatible technology standards for telecommunication equipment; the utility of new technology in protecting public security; the state of current research and development; the use of advanced technology to benefit public safety; and the impact of providing safety and security benefits on new technology.¹³³ The economic and technology environments include efforts by business organizations and industry to diffuse existing technology; to develop, deploy and diffuse new technology for profits; to conform to public demands and to comply with public obligations.

The third grouping includes only one environmental force and its interests but justifies and precedes much of the activities and actions of the political and public policy environments. The social force and its interests include, among others, responding to changes in social norms; recognizing public safety, privacy and other interests; addressing regional cultural differences; and meeting important of social needs.¹³⁴ The social environment is often the driving force or impetus to creating public policy and making legislative policy,

policy-making in the United States and EU).

131. *See supra* Part II and accompanying notes (examining the policy-making forces and public interests involved in establishing and implementing E112 and E911 emergency number call systems).

132. *See supra* Parts II.B and accompanying notes (recognizing telecommunications policy has substantial economic effects in domestic and global markets).

133. *See supra* Parts II.C, III.B and accompanying notes (identifying the technologies and how they are related to providing public needs).

134. *See supra* Parts II.B, II.C and accompanying notes (recognizing that E112 and E19 are public safety policies that further social welfare needs).

including E911 and E112.¹³⁵ These environmental forces interact, compete and conflict within society and policy-making. Unraveling and separating conflict and competition among environmental forces, such as social and economic concerns, and recognizing and weighing their competing interests, such as public safety and cost recovery, is necessary for compromise in deciding the direction and rate of change in establishing policies and regulation, namely E112 and E911.

The macro-analytical framework includes analytical qualities that explain the specific nature and dynamics of an environmental force and its impact on policy guidance, policies and regulation of a regional government. These qualities include (1) recognition of the intergovernmental nature of the force; (2) inherent conflict or competition between two or more forces; (3) the dominance of a force in a legislative policy-making scheme; (4) the governmental level of the force (state or regional); (5) the dynamics or growth of an environmental force under a regulatory scheme; (6) the impact of the force on regulation of commerce and industry; (7) the impact of a force on business and market stability and commercialization of technology; (8) the nature and level of conflict among interests within a force; and (9) the ability of a force to impact the direction or public policy of society.¹³⁶ The environmental or policy forces and their underlying interests show the interaction and intervention of dominant and influential public and private interests under policy-making processes and policies of the EU and U.S. The presence of force-specific interests in policy-making leads to or precedes government regulation of business practices and relationships. Primarily, the qualitative, post hoc macro-analytical review focuses on how public safety, business competition, deploying cellular and location technologies, recovering business cost and other forces-specific interests have had or will have a significant impact on E112 and E911 policy guidance, policies and regulation or law.¹³⁷

A comparative analytical framework includes macro-analytical forces and their interests and micro-analytical criteria to contrast and compare EU and U.S. emergency number call system policies. This analytical framework examines policy forces of the policy-making environment and dominant force-specific interests and determines the impact of policy forces and force-specific interests on E112 and E911 policy guidance, policies and regulation. Parts IV and V illustrate how these forces and interests cause the need for particular provisions in U.S. and EU telecommunications and public safety policy guidance, policies and laws.

135. See *supra* Parts II.B, II.C and accompanying notes.

136. See *infra* Part VI and accompanying notes (reviewing the impact of various business, public safety, and other interests under particular business market and public policy criteria).

137. See *infra* Part VI and accompanying notes.

2. *Micro-Analytical Criteria to Identify and Examine Significant Force-Specific Interests*

Environmental forces involve national, state or regional public and private needs. These regional or U.S. and EU needs contain narrow interests that are made up of smaller, active, influential elements, such as public safety, technology development and privacy. Weighing and examining these elements or interests underlying policy guidance, policies and regulation requires micro-analytics. A micro-analytical framework is necessary to ascertain the weight, impact and other characteristics of one or more force-specific interests in designing, establishing and implementing telecommunications, or E112 and E911, policies and regulation. A micro-analytical framework contains legal, policy and business analytical criteria to examine the impact of force-specific interests on the design of policy guidance, policies and regulation, such as EU recommendations and U.S. statutes. To illustrate, assessing the commercial use of ALI in the U.S. and EU brings into play social forces that explicitly involve, among others, public safety and privacy interests. Like other social interests, privacy interests have a weight and priority in regional and state policy-making.¹³⁸ In protecting the privacy interests of the public and emergency callers, E911 and E112 policies and legislation need to address the public nature, governmental importance, relative weight, social priority and other criteria influencing privacy interests in EU and U.S. policy-making. A micro-analytical framework contains and uses public policy, business, market, legal and other criteria to ascertain the impact and influence of one or more force-specific interests on designing, establishing and implementing E911 and E112 policy guidance, policy and regulation.

Examining one or more force-specific interests requires micro-analytics criteria to recognize and analyze any substantial influence or direct impact of one or more force-specific interests on the design and implementation of legislation, administrative regulations and policy guidance. This analytical framework includes policy, legal and market criteria setting forth the impact, importance, nature and role of a force-specific interest. In examining the impact and significance of force-specific interests, the criteria are as follows: (1) nature and significance; (2) governmental or public importance; (3) subject of an importance state policy concern; (4) domestic market important; (5) specific conflict with other interests; (6) impact on regional commerce; (7) a substantial or fundamental regional interest; and (8) any impact on global business and markets. The criteria apply to business, market and force-specific interests to determine their relevance, impact and significance on the designing, making and implementation of an E911 and E112 regulatory scheme.¹³⁹ The micro-

138. See *infra* Part VI.B.1 and accompanying text (discussing the impact of privacy concerns on EU and U.S. policies for emergency call number systems).

139. See *infra* Part VI and accompanying notes (discussing the application of business and policy criteria to determine the impact of a particular interest).

analytic criteria can be used to analyze findings and purposes of legislative policies and regulation, findings and analysis of business, industry and commerce, and findings and commentaries of business, technology and public policy.¹⁴⁰

In summary, the macro- and micro-analytics give the comparative analytical framework the power to ascertain and examine what and how public and private force-specific interests, such as business and privacy, influence the design and implementation of E112 and E911 regulatory systems.¹⁴¹ Equally important, this analytical framework also suggests that if legislative and agency policy-makers need to amend legislation and promulgate regulations of regional and state E112 and E911 regulatory schemes when technology, commerce or markets and other circumstances adversely affect public safety or another interest and thus undermine an important regional or state public policy, such as public safety, national security or privacy. These macro- and micro-analytics examine whether an environmental force or its interests have had or could have a substantial impact or influence on the design, enactment and implementation of enhanced wireless emergency call number systems or E112 and E911 policy guidance, legislative acts and agency regulations.

IV. EU POLICIES, LAWS AND GUIDANCE ON ESTABLISHING AND IMPLEMENTING E112 SERVICES

In the late 1980s, EU public safety with respect to travel among member states and the growth of digital technology for use in wireline and wireless telephones revitalized public policy concerns regarding the absence of a standard or uniform emergency call number for the European Community.¹⁴²

140. See *infra* Parts IV, V and accompanying notes (discussing the findings, purposes and substance of U.S. and EU emergency call number regulatory schemes).

141. *Communication from the Commission Concerning Coordination and Preparatory Work in the Telecommunications Field Toward the Introduction of a Standard Europe-Wide Emergency Call Number by 1992*, at 2, COM (88) 312 final (June 6, 1988) [hereinafter *Communication for the Commission*]. See Recommendation 2003/558/EC, *supra* note 12, ¶ 12. Paragraph 12 demonstrates the nature of EU policy guidance and its potential impact on commerce and public safety in stating:

In the context of the continuous evolution of concepts and technologies, Member States are encouraged to foster and support the development of services for emergency assistance, for instance to tourists and travelers and for the transport of dangerous goods by road or rail, including handling procedures for forwarding location and other emergency or accident related information to public safety answering points; to support the development and implementation of common interface specifications in ensuring Europe-wide interoperability of such services; and to encourage the use of location technologies with high precision such as third generation cellular network location technologies and Global Navigation Satellite Systems.

Id.

142. *Communication from the Commission: Concerning Coordination and Preparatory Work in the Telecommunications Field Towards the Introduction of a Standard Europe-Wide*

Different emergency call numbers existed among the various member states of the EU.¹⁴³ In a few member states' emergency call systems, various emergency services and assistance programs had different emergency call numbers.¹⁴⁴ This EU public safety concern was heightened by sharp increases in private and business travel within the EU.¹⁴⁵ The EU initiated preparatory work and eventually enacted legislation to establish and implement 112 as a standard emergency call number for emergency assistance and services for EU citizens and tourists traveling in member states.¹⁴⁶

A. *EU Policy Guidance to Establish 112 or Emergency Call Number*

The European Commission established 112 as the standard EU emergency call number under the 1991 EU Commission Proposal on the Introduction of a Standard Europe-Wide Emergency Call Number.¹⁴⁷ Notwithstanding technological, cultural and other differences, the eventual use of new digital technology triggered rapid changes in the telecommunications networks of all member states, hastening the creation of a standard EU emergency call number.¹⁴⁸

1. *Establishing a Single Number Emergency Call System for Europe*

The EU Council adopted the EU Commission proposal and enacted the Council Decision-Single EU Number¹⁴⁹ on July 29, 1991, which was imposed only on EU member states.¹⁵⁰ Article 1 of the Council Decision reads:

1. Member States shall ensure that the number 112 is introduced in public telephone networks as well as in future integrated services digital networks and public mobile services, as the single European emergency call number.

2. The single European emergency call number shall be introduced in parallel with any other existing national

Emergency Call Number by 1992, (COM (88) 312 Final) Jun. 6, 1998, § I (Introduction) [hereinafter COMM (88) 312-EU Standard Emergency Number].

143. *Id.*

144. *Id.*

145. *Id.* at 2.

146. *Id.* at 7.

147. See Decision, 91/396/EEC, *supra* note 6.

148. *Id.* art. 3.

149. Decision 91/396/EEC, *supra* note 6. For definitions of the various forms of EU laws and policies, see Part III.A.1 and accompanying notes (discussing the nature and enforceability of E112 regulation, policies and policy guidance).

150. See Decision 91/396/EEC, *supra* note 6, art. 1.

emergency call numbers, where this seems appropriate.¹⁵¹

The Council Decision required the implementation of 112 by December 31, 1992.¹⁵² Member states were permitted an exception, however, “[w]here particular technical, financial, geographical or organizational difficulties in a Member State [made] the full introduction . . . impossible or too costly”¹⁵³

2. *Creating Separate EU Policies for an Emergency Call Number*

The Council Decision did not mandate an EU standard or uniform emergency call number as a substitute for preexisting national numbers, but instead established 112 as an additional emergency call number.¹⁵⁴ The Council Decision establishes a broad EU public safety law and policy guidance for member states.¹⁵⁵ Yet within a decade or less, the EU Commission Parliament and Council needed to address another 112 public policy concern regarding the need of PSAPs and emergency service centers for location information on cellular and fixed callers who are injured but cannot give precise location information, thus establishing the need for E112 or enhanced wireless emergency call services.¹⁵⁶

151. *Id.*

152. *Id.*

153. *Id.* at arts. 2-3.

154. *Id.* art.1. Article 1 states “[m]ember states shall ensure that the number 112 is introduced in public telephone networks as well as in future integrated services digital networks and public mobile services, as the single European emergency call number.” *Id.*

155. See Decision 91/396/EEC, *supra* note 6, art. 1.

156. See CGALIES Report, *supra* note 11, at 5. The Commission of the Communities (Commission) states that:

In the 1999 Review Communication (citation omitted), the Commission considers that geographical location details should be provided by fixed and mobile operators to the emergency authorities when emergency calls are made. The Commission proposes that location information should be made available to emergency authorities by 1 January 2003. In addition, the eEurope Initiative highlights the possibility for all citizens on the move throughout Europe of having full access everywhere to multilingual support, call localisation and fully organised provision of emergency services through the 112 number. The industry is studying the necessary technical solutions.

Commission of the European Communities, *Sixth Report on the Implementation of the Telecommunications Regulatory Package*, at 34, COM (2000) 814 final. “The present Communication presents a Review of EU regulation in telecommunications, and proposes the main elements for a new framework for communications infrastructure and associated services.” *Id.* at 42; see also European Commission, *Towards a New Framework for Electronic Communication Infrastructure and Associated Services The 1999 Communications Review*, at ii, COM (1999) 539 [hereinafter *New Framework*]. Thus, the EU was setting forth policy guidance, though extremely soft, on the need for location information in implementing an effective emergency call services system when the 1999 Communication Review, stated:

Technological developments now allow the geographical location not only of fixed but also of mobile phones to be determined. It is feasible and in the public interest to set a date by which all fixed and mobile operators provide caller

B. EU Preparatory Work for Establishing and Implementing E112

The European Commission established two implementation committees to begin preparatory work on establishing and implementing E112 or enhanced wireless emergency call services.¹⁵⁷ The first EU implementation committee was created in 2000 to investigate the need for and use of location information by cellular users in establishing and implementing enhanced wireless emergency call services or E112.¹⁵⁸ The second committee was created to investigate the need and use of wireline and wireless location information in the EU.¹⁵⁹ The second EU implementation committee issued its initial report to fulfill one of its objectives was to introduce timely findings to the first EU investigative committee in order to help build consensus on the policy-making approach to be adopted for the establishment and implementation of enhanced wireless emergency services.¹⁶⁰

location details to the emergency authorities when emergency calls are made. In view of the sensitivity of location data to the privacy of mobile callers, appropriate safeguards for personal data and privacy protection must be established to ensure compliance with EU rules in this area. Given the importance of such a facility for the European citizen and the state of technological development, location information for emergency authorities should be made available by 1 January 2003. This would fit in with the timescale envisaged for implementation of the new regulatory framework.

Id. CGALIES notes that privacy is and will be a major legal issue in the information from location acquisition technologies. *See* CGALIES Report, *supra* note 11, at 6 (noting that work of CGALIES would be supported by several EU Commission research and development project).

157. *See* VAN GERVEN, *supra* note 19, at 17 (finding the EU Council will delegate implementation of legislation to the EU Commission, but this implementation is subject to certain EU Council requirements). One of the EU Council's typical requirements is to require the EU Commission to be assisted by a committee of civil servants or external experts in performing preparatory work for implementation of legislation. *Id.* *See also infra* Part IV.B and accompanying notes (discussing the two implementation committees created by the EU Commission in establishing and implementing E112).

158. CGALIES Report, *supra* note 11, at 6 (noting that work of CGALIES would be supported by several EU Commission research and development projects); *see infra* Part IV.B.1 and accompanying notes (explaining the purpose of the other implementation committee). The final CGALIES Report was issued on January 28, 2002. CGALIES Report, *supra* note 11, at 2.

159. *See* European Community Commission, *Location of Cellular Users for Emergency Services* (LOCUS), 1 (January 3, 2002) [hereinafter LOCUS Report]. LOCUS is an EU implementation committee that was established by the EU Commission to address the technology policy concerns of the 5th Research Framework Programme of the European Community. *Id.* LOCUS was initiated in June 2000 and concluded in December 2001; the final LOCUS Report was issued on March 1, 2002. *Id.* at 1. The implementation committee coordinator was Telematika e.K (DE) and other committee members of LOCUS; the authors of the LOCUS Report were "France Developpement Conseil SARL (FR), Max.mobil. Telekommunikation Servie GmbH, Motorola UK Ltd (UK), Telespazio SpA (IT), and the Public University of Navarra (ES)." *Id.*

160. *Id.* at 4.

1. *Investigating the Economic Impact of Implementing E112*

The first EU Committee was the Location of Cellular Users for Emergency Services (LOCUS) that was created in 2000 and issued its final report on March 1, 2002.¹⁶¹ LOCUS' focus was on the need for and use of cellular and wireless location information.¹⁶² LOCUS recognized the commercial assistance services and value added location-based services that could be provided by the commercial development of automatic location technologies.¹⁶³ Explicitly, LOCUS focused on issues related to the need for location information technology by wireless or cellular systems, future commercial applications and foreseeable markets for location technologies, and two general implementation options.¹⁶⁴ Finally, another of LOCUS' objectives was "[t]he active support to consensus building by the timely introduction of findings to the Coordination Group on Location Services taking into account feedback."¹⁶⁵

LOCUS recognized that the FCC had chosen a forceful regulatory approach that mandates wireless carriers to provide location information notwithstanding business circumstances and economic conditions.¹⁶⁶ However, LOCUS found two principal implementation options: EU regulation and EU market-driven approaches to member states and wireless carriers.¹⁶⁷ On one hand, the EU regulatory approach would require the EU Commission, Council and Parliament to jointly establish and implement accuracy requirements for different environments, dates for mandatory implementation, and general principles for financing.¹⁶⁸ On the other hand, the EU market-driven or policy guidance approach would rely on market forces to commercialize high-accuracy automatic location technologies (ALI) while simultaneously providing location-based services and information to enhance 112 emergency call services.¹⁶⁹ The market-driven approach obligated only the wireless carriers that had implemented automatic location technology to provide location information to the PSAPs.¹⁷⁰ The policy guidance approach would not mandate or establish minimum standards for data quality and location accuracy.¹⁷¹ Thus the policy approach could create disparity in provision of location information by wireless carriers among PSAPs, wireless subscribers and location information users in that location information of a different quality and accuracy could be provided

161. *Id.* at 1.

162. *Id.* at 3.

163. *Id.* at 3.

164. *Id.* at 4.

165. *Id.*

166. *Id.* at 3.

167. *Id.* at 12.

168. *Id.*

169. *See id.*

170. *See id.*

171. *See id.*

to each group.

LOCUS applied particular criteria to examine and evaluate the advantages and disadvantages of the regulatory approach and market driven or mere policy guidance approach.¹⁷² LOCUS considered in the implementation of an EU regulatory scheme the macro-economic benefits to EU and member state economies: the commercial development and market for location based services and assistance, availability of business models and plans for the commercialization of location based services, and implications of poor financial returns and expectations.¹⁷³ In contrasting regulatory and policy guidance approaches, LOCUS consider market or business cost of the various location technologies to estimate the likelihood of carriers achieving a return on their investment through commercial location based services.¹⁷⁴ LOCUS concluded that the policy guidance or market-driven approach that requires the commercialization of ALI technology was the more appropriate policy choice for the EU to impose on member states.¹⁷⁵ The rationale for establishing and implementing less forceful EU policy guidance or market driven policy-making was that less forceful regulation or policy guidance would permit technology manufacturers to develop ALI technologies for commercial purposes.¹⁷⁶ This would not require wireless carriers to deploy and diffuse costly or highly expensive ALI technology.¹⁷⁷ Moreover, LOCUS recognized that EU and member states did not have in place business models or financial recovery mechanisms to support the costly deployment and diffusion of ALI deployments for public benefits or purposes, namely E112.¹⁷⁸ LOCUS' findings would now be available for use by another EU implementation committee that was established to investigate the need and use of location information by PSAPs, wireless carriers and wireless subscribers in establishing and implementing E112.¹⁷⁹

2. *Investigating the Nature of ALI Technology in Implementing E112*

In creating the second implementation committee, the European Commission sought to find "harmonized, timely and financial[ly] sound solutions."¹⁸⁰ The Coordination Group on Access to Location Information for Emergency Services (CGALIES) was established as a public service-private

172. *See id.* at 12-13.

173. *See id.*

174. *See id.* at 13.

175. *Id.* at 5 (implementing E112 but not minimizing the impact on the business development location-based services and markets).

176. *Id.* at 12-13.

177. *Id.*

178. *Id.* at 12-13.

179. *Id.* at 3.

180. CGALIES Report, *supra* note 11, at 5.

sector partnership in 2000.¹⁸¹ CGALIES established work groups and focused on the identification of “[m]inimum ‘standards’ on location data accuracy, reliability and evolution path,” “[m]inimum requirements for location reference system . . . , routing and networks . . . , databases and . . . PSAPs . . . , and [a]nalysis of financing and costs”¹⁸² and the impact on the quality of services and implementation.¹⁸³ In January 2002, CGALIES issued its final report that considered technology, cost of implementation and requirements issues.¹⁸⁴ Its implementation options examined and found that existing location technologies are feasible,¹⁸⁵ concluded that telecom providers/operators and PSAPs must address cost issues¹⁸⁶ and that uncertainty and divergence of views existed in the implementation of commercial location services.¹⁸⁷ CGALIES proposed several scenarios to pay for the implementation of E112.¹⁸⁸ Moreover, CGALIES presented two implementation scenarios to implement E112: a market-driven regulatory scheme with little or no impact on the E112 situation¹⁸⁹ and an outcome-driven or mandatory regulatory scheme that would require network providers, member states and PSAPs to meet particular obligations.¹⁹⁰

CGALIES noted that GSM is the dominant cellular technology for Europeans, who owned almost 250 million GSM cellular telephones in January 2002.¹⁹¹ CGALIES also found that member states provided funds or established budgets for PSAP operations.¹⁹² PSAPs, in turn, provided funding for LECs or Telecom Operators to interface with wireless carriers and operators and would also provide funding for the installation of software and hardware needed to receive location information.¹⁹³ CGALIES pointed out that some member states can own location databases and fixed lines.¹⁹⁴ Finally, CGALIES noted that the use of “GSM 112” had caused the budget in some member states to increase significantly between 1998 and 2002.¹⁹⁵ In addition, network providers and operators bore the cost for developing and installing network infrastructure and providing network or cellular services.¹⁹⁶ CGALIES

181. *Id.*

182. *Id.* at 6.

183. *Id.*

184. *Id.*

185. *Id.* at 27.

186. *Id.* at 28.

187. *Id.* at 30.

188. *Id.* at 31.

189. *Id.* at 32.

190. *Id.* at 33.

191. *Id.* at 34.

192. *Id.* at 8. One must conclude that GSM is the dominant if not the only cellular standard used in the EU. *See id.*

193. *Id.* at 29.

194. *Id.* at 29-30.

195. *Id.* at 29.

196. *Id.*

made no mention of any cost recovery mechanism to offset the cost of network operators and providers. In initiating a market-driven approach for the time being, CGALIES found that a small amount of commercialization of location information services existed in EU and that more services were expected in the EU.¹⁹⁷

C. *Establishing the E112 or Enhanced Wireless Emergency Services*

The European Parliament and Council relied on CGALIES and LOCUS to enact Directive 2002/22/EC on *Universal Service and Users' Rights Relating to Electronic Communications Networks and Services*.¹⁹⁸ Directive 2002/22/EC protects the rights and services of users who receive and use telecommunications services and devices.¹⁹⁹

1. *Establishing E112 in the EU*

Specifically, Article 26, *Single European Emergency Call Number*, of the directive pertains to E112 and the need for automatic location information.²⁰⁰ Article 26 states that:

197. *Id.* at 32.

198. Directive 2002/22/EC, *supra* note 12, at, art. 26. The United States has established and implemented universal services for its telecommunication users. *See* 47 U.S.C. § 254 (2006). Universal services in the United States are evolving services that consider educational and other public needs, market choices, deployment by telecommunications carriers, public interests, and other policies. *See* 47 U.S.C. § 254(c)(1).

199. *See* Directive 2002/22/EC, *supra* note 12, art. 26.

200. *Id.* art. 1. Article 1 of Directive 2002/22/EC, contains the scope and aims of the directive which include:

1. Within the framework of Directive 2002/21/EC (Framework Directive), this Directive concerns the provision of electronic communications networks and services to end-users. The aim is to ensure the availability throughout the Community of good quality publicly available services through effective competition and choice and to deal with circumstances in which the needs of end-users are not satisfactorily met by the market.

2. This Directive establishes the rights of end-users and the corresponding obligations on undertakings providing publicly available electronic communications networks and services. With regard to ensuring provision of universal service within an environment of open and competitive markets, this Directive defines the minimum set of services of specified quality to which all end-users have access, at an affordable price in the light of specific national conditions, without distorting competition. This Directive also sets out obligations with regard to the provision of certain mandatory services such as the retail provision of leased lines.

Article 26

Single European Emergency Call Number

1. Member States shall ensure that, in addition to any other national emergency call numbers specified by the national regulatory authorities, all end-users of publicly available telephone services, including users of public pay telephones, are able to call the emergency services free of charge, by using the single European emergency call number '112'.

2. Member States shall ensure that calls to the single European emergency call number '112' are appropriately answered and handled in a manner best suited to the national organization of emergency systems and within the technological possibilities of the networks.

3. Member States shall ensure that undertakings which operate public telephone networks make caller location information available to authorities handling emergencies, to the extent technically feasible, for all calls to the single European emergency call number '112'.

4. Member States shall ensure that citizens are adequately informed about the existence and use of the single European emergency call number '112'.²⁰¹

Article 26 is part of an EU Directive that member states must further or advance the objectives pertaining to E122 within a certain duration, but permits member states to choose the substantive means by which to implement EU objectives.²⁰² Member state legislatures implement directives by means of their own respective legislative procedures and practices.²⁰³

2. *Implementing E112 in the EU*

In further establishing and implementing wireless E112, the European

201. *Id.* art. 26.

202. Treaty Establishing the EU, *supra* note 61, art. 256.

203. *Id.*

Commission enacted a Recommendation on July 25 2003,²⁰⁴ *Processing of Caller Location Information in Electronic Communication Networks for the Purpose of Location-Enhanced Emergency Call Services*.²⁰⁵ While EU Recommendations are technically not binding, they are generally followed because they often serve as the predecessor of binding legislation.²⁰⁶ The European Commission recommended that when member states were to integrate the Directive²⁰⁷ into national law, they should apply a variety of harmonized conditions and principles to the provision of caller location information for all calls to the single European emergency call number 112.²⁰⁸ The European Commission was silent on what remedies are available when transmission by wireless and other operators to PSAPs is inaccurate or incorrect location information of injured wireline and wireless subscribers is given, thus, member states must provide justice in these situations.²⁰⁹ The European Commission also found that using location and telephone numbers could invade the privacy of emergency callers. Thus the European Commission permits emergency centers and personnel to use location information only for emergency purposes and imposed limits on the location information, unless the consent of wireless subscribers is given.²¹⁰ The European Commission recommendations to member states are technical standards and requirements.

The European Commission proposed several recommendations that greatly impacted the implementation of wireless E112. Foremost, the

204. Recommendation 2003/558/EC, *supra* note 12.

205. *Id.*

206. Treaty Establishing the EU, *supra* note 61, art. 256.

207. Directive 2002/22/EC, *supra* note 12, art. 26.

208. Recommendation 2003/558/EC, *supra* note 12, at recommendation 1.

209. *See id.* ¶¶ 5-6 (“Whereas”). The European Commission recommends no immunity or exemption from liability for the transmission of inaccurate or incorrect location information by wireless or wireline operators. *Id.* CGALIES found incorrect and inaccurate location information would be transmitted because street and address location databases were not updated or revised frequently enough. CGALIES Report, *supra* note 11, at 10. However, the European Commission does not impose mandates on member states or wireless carriers when it requires only the “best effort to determine and forward the most reliable caller location information . . .” Recommendation 2003/558/EC, *supra* note 12, ¶5 (“Whereas”). Further, the European Commission requires a very low standard of care unlikely to be breached other than in exceptional circumstances. CGALIES found a liability issue could arise if the position function failed to locate the wireless callers. CGALIES Report, *supra* note 11, at 14.

210. *See* Recommendation 2003/558/EC, *supra* note 12, ¶ 2 (“Whereas”). In making location information available to PSAPs and other emergency personnel, the European Commission states:

Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services (the 'Universal Service Directive') . . . [OJ L 108, 24.4.2002, p. 31], requires public telephone network operators (hereafter 'operators') to make caller location information available to authorities handling emergencies, to the extent technically feasible, for all calls made to the single European emergency call number 112. . . .

Id. The European Commission does not require emergency services to receive permission from the wireless subscribers. *Id.*

Commission recommended that wireless carriers or network operators that initiated the emergency call, should transmit or forward (push) to emergency centers and PSAPs “the best location information available as to the location of the caller, to the extent technically feasible.”²¹¹ In pushing location information to PSAPs and emergency centers, the transmission or provision of location information for an emergency caller on a specific request by emergency centers or PSAPs was no longer accepted after December 31, 2004, which was the conclusion of the review period for Recommendation 2003/558/EC.²¹² Next, when the subscriber or user’s number in an emergency call can be identified, public telephone network operators or LECs should provide the capability “to public safety answering points and emergency services of renewing the location information through a call back functionality (pulling) for the purpose of handling the emergency.”²¹³ Finally, the scope and aims of the European Commission’s recommendations are broad in order to facilitate data transfer between LECs or operators and PSAPs and allow member states to encourage the use of a common open interface standard, and in particular, a common EU data transfer protocol.²¹⁴

211. Recommendation 2003/558/EC, *supra* note 12, ¶2 (“Whereas”).

212. *Id.* at Recommendation 13.

213. *Id.* at Recommendation 9.

214. *Id.* ¶¶ 3-7, ¶10. Recommendation 2003/558/EC lists EU policy considerations as follows:

(3) Although this Recommendation is concerned with location-enhanced 112, it is understood that parallel national emergency call numbers will be enhanced with the same functionality and following the same principles. . . .

(4) For the successful implementation of E112 services throughout the Community, implementation issues must be addressed and timescales for the introduction of new systems coordinated. The Coordination Group on Access to Location Information by Emergency Services (CGALIES) established by the Commission in May 2000 as a partnership of public service and private sector players has allowed players of different sectors to discuss and find agreement on the principles for harmonized and timely implementation.

(5) Following on from the recommendation by CGALIES, providers of the public telephone network or service should use their best effort to determine and forward the most reliable caller location information available for all calls to the single European emergency call number 112.

(6) During the introductory phase of E112 services, application of the best efforts principle is considered preferable to mandating specific performance characteristics for location determination. However, as public safety answering points and emergency services gain practical experiences with location information, their requirements will become more defined. Moreover, location technology will continue to evolve, both within mobile cellular networks and satellite location systems. Therefore, the best effort approach will need to be reviewed after the initial phase.

(7) It is important for all Member States to develop common technical solutions and practices for the provision of E112. The elaboration of common technical solutions should be pursued through the European standardization organizations, in order to facilitate the introduction of E112, create interoperable solutions and decrease the costs of implementation to the European Union.

The EU enacted a telecommunications directive mandating that member states establish and implement E112 as the European single emergency call number but later chose a public safety recommendation to set forth substantive standards for wireless E112 that must now include location information, even if not requested by the PSAPs.

V. US POLICIES, LAWS AND POLICY GUIDANCE ON ESTABLISHING AND IMPLEMENTING E911

In the U.S. political system, Congress sets forth wireless communications and related public safety policy in two major pieces of federal legislation. Congress enacted the Wireless Communications and Public Safety Act of 1999²¹⁵ (Wireless Safety Act) and the Ensuring Needed Help Arrives Near Callers Employing 911 Act of 2004²¹⁶ (Enhanced 911 Act). Federal policy does not favor one cellular standard or one automatic location technology and has remained technologically and competitively neutral during the implementation of E911 by encouraging competition and product development.²¹⁷ The FCC also seeks to enhance the quality and reliability of 911 emergency call services by requiring wireless carriers to provide ALI to PSAPs. The FCC mandates that subscribers of wireless phone services receive the same quality of emergency call services as that available to wireline callers.

...

(13) To achieve the objectives of this Recommendation, the need for a continued dialogue between public network operators and service providers and public authorities including emergency services becomes even stronger.

Id.

215. Pub. L. 106-81, 113 Stat. 1286 (1999) (codified as amended in scattered sections of 47 U.S.C.); 47 U.S.C § 222 (2005); 47 U.S.C § 251 (2005). For an analysis of the pertinent provisions of Wireless Safety Act and their effectiveness see Holloway, et al., *supra* note 127, at 106-10.

216. Pub. L. 108-494, 118 Stat. 3986 (2004) (codified as amended in scattered parts of 47 U.S.C). For an analysis of the pertinent provisions of Enhanced Act and their effectiveness see Holloway, et al., *supra* note 127, at 110-114.

217. See *In re Revision*, 12 FCC Rcd, *supra* note 52, ¶¶ 5, 123. The FCC has relied on technology-neutral standards to avoid interference with competition and, thus, has relied on general performance standards to encourage the deployment of technology. See *id.* ¶ 5. Specifically, the FCC states:

We also reemphasize that our rules are intended to be technology-neutral, and to encourage the most efficient and effective technologies to report the location of wireless handsets, the most important E9-1-1 feature both for those seeking help in emergencies and for the public safety organizations that respond to emergency calls.

Id. ¶ 5. The FCC also states:

One further point deserves mention. In setting deadlines and benchmarks for ALI, our policy has been to be technologically and competitively neutral. As we indicated in the E9-1-1 First Report and Order, our intention was to adopt general performance criteria, rather than extensive technical standards, to guide the development of wireless 9-1-1 services. Our goal is to ensure the rapid, efficient, and effective deployment of ALI as part of E9-1-1

Id. ¶ 123.

Federal communication policy includes providing universal services to US citizens and public. The United States has established and implemented universal services for its telecommunication users.²¹⁸ “Universal service is an evolving level of telecommunications services . . .”²¹⁹ and now considers educational and other public needs, market choices, deployment by telecommunications carriers, public interests, and other policies.²²⁰ In establishing universal service, the FCC must consider the telecommunications and information technologies.²²¹

A. Establishing E911 or Enhanced Wireless Emergency Call Services in the United States

The Wireless Safety Act “‘promote[s] public safety’ by making 9-1-1 the universal emergency assistance number, by furthering deployment of wireless 9-1-1 capabilities and related functions, and by encouraging construction and operation of seamless, ubiquitous, and reliable networks for wireless services.”²²² The Wireless Safety Act designated 911 as the universal emergency number for all forms of U.S. telephone service.²²³

1. Authorizing the FCC to Encourage and Support the States

The Wireless Safety Act authorizes the FCC to encourage and support the states in establishing and implementing comprehensive end-to-end enhanced wireless emergency call systems.²²⁴ Moreover, the Wireless Safety Act creates parity between wireline and wireless carriers for tort and other liabilities related to transmission mistakes and technical failures causing harm to subscribers and other parties.²²⁵ Finally, the Wireless Safety Act prohibits wireless carriers from disclosing or using wireless subscribers’ location information for purposes other than emergencies, except with authorization or permission of the subscriber.²²⁶

218. See 47 U.S.C. § 254 (2006).

219. See *id.* § 254(c)(1).

220. *Id.*

221. *Id.*

222. 47 U.S.C. § 615 (2006) (providing the language of the Preamble of the Wireless Safety Act). See also Holloway, et al., *supra* note 127 at 106-110 (examining the provisions of the Wireless Safety Act and its effectiveness in furthering E911 policies).

223. 47 U.S.C. § 251(e) (2006).

224. 47 U.S.C. § 615 (2006).

225. 47 U.S.C. § 615a (2006).

226. 47 U.S.C. § 222(f) (2006). Although E911 has great potential to reduce human suffering and save lives, the ALI technology of E911 could be equally as destructive in destroying the privacy of tens of millions of Americans and, thus, raises timely federal and state privacy issue. See Matthew Mickle Werdegar, Note, *Lost? The Government Knows Where You Are: Cellular Telephone Call Location Technology and the Expectation of Privacy*, 10 STAN. L. & POL’Y REV. 103 (1998). The ALI technology permits other parties to track and contact wireless subscribers for commercial purposes as they own or use their cellular telephones. See

2. *Substantive Obligations on the FCC but Not the States*

Sections II-V of the Wireless Safety Act contain the substantive provisions that impose obligations on the FCC to support and encourage the implementation of an effective and ubiquitous E911 system.²²⁷ Section II proclaims the importance of establishing and maintaining an end-to-end communications infrastructure for emergency services.²²⁸ Congress also determined that an end-to-end emergency communications infrastructure would reduce emergency response times and thus save both thousands of lives and billions of dollars in health care costs.²²⁹ Congress also found that it was necessary to encourage statewide coordination among emergency service providers, establish funds for technology development and deployment, integrate emergency communications with traffic control and management systems, and charge the FCC with designating 911 as the nation's official emergency number.²³⁰ The Wireless Safety Act requires the FCC to "encourage and support efforts by States to deploy comprehensive end-to-end emergency communications infrastructure and programs, based on coordinated statewide plan, including seamless, ubiquitous, reliable wireless telecommunications networks and enhanced wireless 9-1-1 service."²³¹

B. *Implementing E911 Policy and Regulation*

The FCC has used federal telecommunications and communications policy to regulate emergency call services or 911 since 1967 when the President's Commission on Law Enforcement and Administration of Justice assigned the task of establishing a single emergency number to the FCC.²³² The FCC promotes safety of life through imposing and enforcing obligations on the uses of wire and radio communication for emergency services and assistance.²³³

CGALIES, *supra* note 11, at 33 (discussing a market-driven scenario that provides location based services and E112 services); *see also* Hatfield, *supra* note 11, at 43-44 (recognizing a symbiotic relationship between E911 and location-based services but noting that the FCC has shown no interest in commercialization); *See* Stanton Zeff, *A New Spin on Location Services*, TELECOMMUNICATIONS AMERICAS, Sep. 2004, at 36, 36-37 (recognizing the income producing potential of location-based services). The Wireless Safety Act sought to limit disclosure or use of location information for purposes that could interfere or intrude on the privacy interests of wireless subscribers. *See* 47 U.S.C. § 222(f). Of course, in making the technology available for commercial uses, the subscribers can give comment for use of this location information. *Id.*

227. 47 U.S.C. § 615(a).

228. *Id.* § 615(a)(1).

229. *Id.*

230. *Id.* § 615(a)(2).

231. *Id.* § 615 (Note).

232. *See* Press Release, FCC Wireless Telecommunications Bureau, FCC Acts to Promote Competition and Public Safety in Enhanced Wireless 911 Services, No. 99-32, (Sept. 15, 1999).

233. *See* Ensuring Needed Help Arrives Near Callers Employing 911 Act of 2004, Pub. L. No. 108-494, 118 Stat. 3986 (2004); Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81 (1999); Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996); Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1064 (1934).

In mid 1996, the FCC formally mandated that wireless 911 callers receive the same level of emergency call services as that available to wireline callers.²³⁴ This emergency call service enables emergency dispatchers at PSAPs to locate callers from wireless phones.²³⁵ Originally, the FCC order mandated a five-year plan for implementation of wireless E911 in two major phases to satisfy both public safety and wireless carrier feasibility perspectives.²³⁶

1. *FCC Policy-Making to Implement E911*

Phase I of FCC policy-making for the implementation of E911 required mobile carriers to provide PSAPs with location information and callback number.²³⁷ Phase I required that calls be routed to the operator at the appropriate PSAP based on serving cell/sector information.²³⁸ Next, Phase I required carriers to have in place a system to convey to the PSAP the 911 caller's callback number information as well as the location of the cell tower or base station receiving the 911 call.²³⁹ Phase II required carriers to provide ALI (the location of wireless callers).²⁴⁰ This location was defined in two dimensions (longitude and latitude) within a radius of no more than 125 meters (410 feet) for at least 67 percent of all wireless E911 calls.²⁴¹

Phase II required wireless carriers to provide PSAPs with the location of all 911 callers by longitude and latitude in accordance with specified accuracy requirements.²⁴² Such requirements were dependent on whether the carrier chose a network-based or handset-based solution.²⁴³ However, Phase II had limited success implementing enhanced wireless emergency call services during the first five-year plan.²⁴⁴ During Phase II, the FCC granted limited waivers to six wireless carriers, but imposed revised deployment schedules and quarterly reporting requirements.²⁴⁵ Wireless carriers and PSAPs were not prepared to meet the FCC implementation plan or deployment schedule.²⁴⁶ Many carriers failed to meet the deployment requirements of Phase II by the required date of

234. See 47 C.F.R. § 20.18(b) (2006).

235. See *id.* § 20.18(e).

236. See *id.* § 20.18(a)-(f).

237. See *id.* § 20.18(d).

238. *Id.*

239. *Id.*

240. See *id.* § 20.18(h).

241. *Id.* § 20.18(e).

242. *Id.*

243. See *id.* § 20.18(e), (h).

244. See Hatfield Report, *supra* note 11, at 17. More than seven thousand 911 call centers exist in the United States. *Id.* at 18. Wireless carriers are national or regional in scope and their service areas exceed the boundaries of any one call center. *Id.* at 18-19. In a typical region served by one LEC, there may be six or seven wireless carriers, using varying cellular technologies and their supporting location solutions, multiple PSAPs, and millions of consumers. *Id.*

245. *Id.* at 8.

246. See *id.*

October 1, 2001.²⁴⁷ As of May 12, 2005, only six states had implemented Phase II.²⁴⁸ In December 2005, two-thirds of the nation's citizens resided in areas compliant with Phase I and II.²⁴⁹

2. State Policy-Making for Implementing E911

Though the Wireless Safety Act requires the FCC to encourage and support states in implementing E911 call systems, the FCC does not regulate state entities, such as PSAPs.²⁵⁰ The Wireless Safety Act states that “[n]othing in this section shall be construed to authorize or require the Commission [FCC] to impose obligations or costs on any person.”²⁵¹ The FCC, however, can impose deadlines and fines on the communication industry for failure to procure location information even if state and local governments have not yet deployed adequate communication infrastructure and programs to receive such information.²⁵²

The FCC regulation permits states to place the costs of implementing E911, such as ALI technology development and location information, with the wireless carriers even though it is a public benefit neither required nor necessary to provide cellular telephone services.²⁵³

In *U.S. Cellular Corp. v. FCC*,²⁵⁴ the United States Court of Appeals for the District of Columbia Circuit decided whether wireless carriers could be

247. See *In re Revision of the Comm'n Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, 15 F.C.C.R. 17442, 17445 (FCC Sept. 8, 2000) (Fourth Memorandum Opinion and Order).

248. Squeo, *supra* note 1.

249. See Press Release, National Emergency Number Association, Two-thirds of Population Now Covered by Phase II Wireless E9-1-1: NENA Releases Current Wireless 9-1-1 Statistics, (Dec. 22, 2005), available at http://www.nena.org/Press_Room/releasesnew/12.20.05%20wireless%20statistics.pdf.

250. See 47 U.S.C. § 615 (2006).

251. *Id.*

252. See 47 U.S.C. §§ 158-159 (2002) (giving the FCC the regulatory authority to impose regulatory fees to cover the costs of operations and administration); see 47 U.S.C. §§ 502-503 (2002) (authorizing forfeitures and fines on medial and wireless carriers).

253. See *In re Revision of the Comm'n's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Memorandum and Order, 14 F.C.C.R. 20850, 20885-86 (FCC Dec. 8, 1999) (Second Memorandum Opinion and Order) [hereinafter E911 FCC Second Memorandum and Order] (finding carrier cost recovery could become an obstacle to implementation of E-911); See *In re of Revision of the Comm'n's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, 12 F.C.C.R. 22665, 22734-35 (FCC Dec. 23, 1997) (First Memorandum Opinion and Order) [hereinafter E911 FCC First Memorandum and Order] (refusing to provide a cost recovery mechanism for carrier). The FCC's original position on cost recovery required a cost recovery mechanism to be in place for the implementation of E911. See 1996 FCC Report, *supra* note 93, at 18699 (requiring cost recovery mechanism to be in place but not requiring a specific mechanism and recognizing a negative impact on implementation of an inflexible federal mechanism).

254. *U.S. Cellular Corp. v. FCC*, 254 F.3d 78 (D.C. Cir. 2001).

forced or mandated to bear the cost of implementing wireless E911.²⁵⁵ The court concluded that wireless carriers should bear the financial burden of implementing E911 emergency call services for wireless subscribers, rather than imposing this burden on government-owned PSAPs that provide public safety benefits but do not contribute to the cost of those benefits.²⁵⁶ The D.C. Circuit held that the FCC's refusal to impose a cost recovery mechanism on municipal, county or state governments did not violate the cost causation principle.²⁵⁷ The court found that although the FCC imposed the costs on wireless carriers, the carriers could in turn impose implementation cost on the wireless subscribers receiving the benefits of E911.²⁵⁸ Consequently, the development, deployment and diffusion of cellular standard and location technologies depend on both the availability and abundance of private resources. However, wireless carriers are providing a public safety benefit for wireless subscribers and the public both exposed to national security and natural disaster threats.

C. Public Safety and Telecommunication Regulation to Implement E911

Congress enacted the ENHANCE 911 Act of 2004²⁵⁹ to expand the E911 wireless emergency call services system policy, but it did not make state obligations more forceful.²⁶⁰ The objectives of the ENHANCE 911 Act are to

improve, enhance, and promote the Nation's homeland security, public safety, and citizen activated emergency response capabilities through the use of enhanced 911 services, to further upgrade [PSAP] capabilities and related functions in receiving E-911 calls, and to support in the construction and operation of a ubiquitous and reliable citizen activated system.²⁶¹

1. Public Safety Policy to Encourage State and Local Participation

Section 102 of ENHANCE 911 outlines the congressional findings and finds that the 911 emergency call number system protects public safety and homeland security but needs public resources, state policy coordination and

255. *Id.* at 83.

256. *Id.* at 85.

257. *Id.* at 84.

258. *Id.* at 88.

259. See E-911 Regulation, *supra* note 127, at 110-14 (examining the Enhanced 911 Act of 2004, including its benefits and advantages).

260. See 47 U.S.C. § 151 (2006).

261. ENHANCE 911 Act of 2004, Pub. L. No. 108-494, 118 Stat. 3986, 3986 (codified in scattered sections of 47 U.S.C.).

management of E911 fees.²⁶² Section 102 finds that taxes and federal leadership are needed to implement E911.²⁶³ Section 103 lists the act's purposes:

(1) to coordinate 911 services and E-911 services, at the Federal, State, and local levels; and (2) to ensure that funds collected on telecommunications bills for enhancing emergency 911 services are used only for the purposes for which the funds are being collected.²⁶⁴

Section 104 amends the National Telecommunications and Information Administration Organization Act²⁶⁵ providing for the coordination of E911 implementation by a federal office.²⁶⁶ Section 104 also includes a termination provision, leading one to conclude that E911 problems could be corrected by 2009.²⁶⁷ The conclusion of any near term correction, however, appears to be only wishful congressional thinking, as Congress chose not to fund the ENHANCE 911 Act.²⁶⁸

262. See Pub.L. 108-494, Title I, § 103, Dec. 23, 2004, 118 Stat. 3986.

263. See *id.*

264. *Id.* § 103.

265. *Id.* § 104. The National Telecommunications and Information Administration Organization Act created the National Telecommunications and Information Administration (NTIA). 47 U.S.C. § 901(b)(6) (2006). Section 901 (b)(6) states NTIA is "principally responsible for advising the President on telecommunications and information policies, and for carrying out the related functions it currently performs, as reflected in Executive Order 12046." *Id.*

266. See 47 U.S.C. § 942(a)(1)(A).

267. See *id.* § 942(d)(2) (stating the authorization of funding for the ENHANCE Act under 47 U.S.C. § 942 (d)(1) will expire on Oct. 1, 2009).

268. See Squeo, *supra* note 1, at A1; Press Release, National Emergency Number Association, Over 35 National Organizations Request Full Funding for ENHANCE 911 Act In Letter to Congress, (Feb. 24, 2005), available at <http://www.nena.org/UserFiles/File/ENHANCE%20911%20Act%20Funding%20Support%20Letter%20Release%202.24.pdf>. NENA "foster[s] the technological advancement, availability and implementation of a universal emergency telephone number system (9-1-1)." NENA, What Is NENA?, <http://www.nena.org/pages/Content.asp?CID=119&CTID=38> (last visited Apr. 4, 2008). "NENA promotes research, planning, training and education. The protection of human life, the preservation of property, and the maintenance of general community security are among NENA's objectives." *Id.* The EU counterpart to NENA is the European Emergency Number Association (EENA). EENA, Objectives, available at <http://www.eena.org/view/en/activities/objectives.html;jsessionid=1C10DEA18C69172FF27AAD057A1D9984>. (last visited on Apr. 23, 2008). EENA's "main objective is to promote the knowledge and efficient use of the 112, the single European Emergency Call Number, all over Europe . . ." *Id.* EENA "act[s] as a discussion platform bringing together all the actors (organizations, emergency services, enterprises and individuals) involved with the development and implementation of the 112." *Id.*

2. *Unfunded Carrot Approach to Effect State Policy-Making for E911*

Congress uses financial incentives to encourage states to establish and implement an E911 emergency call system. Section 104 creates "Phase II E-911 Implementation Grants"²⁶⁹ that permit "[t]he Assistant Secretary and the Administrator, after consultation with the Secretary of Homeland Security and the Chairman of the Federal Communications Commission, and acting through the Office, shall provide grants to eligible entities for the implementation and operation of Phase II E-911 services."²⁷⁰ Section 105 requires the Government Accounting Office to study and report on the imposition and use of fees by political subdivisions.²⁷¹ While, Section 106 obligates the FCC to study and report the history and status of waivers that have been offered under Phase II to Congress.²⁷² Finally, Section 107 authorizes the FCC to grant waivers to a "provider of commercial mobile service (as defined in section 332(d) of the Communications Act of 1934²⁷³ ...) that had 500,000 or fewer subscribers as of December 31, 2001."²⁷⁴ The U.S. E911 policies impose public safety and telecommunication obligations on wireless carriers and require connection to PSAPs when they are ready to receive location information, but U.S. E911 policies are primarily federal policy guidance for state and governments that must eventually provide hardware and software equipment to receive emergency calls requiring wireless carriers to transmit telephone numbers and location information from wireless subscribers.

VI. COMPARATIVE REVIEW OF EU AND U.S. ENHANCED WIRELESS EMERGENCY CALL SERVICES POLICY-MAKING AND POLICIES AND REGULATION

The comparative review uses a business market-public policy approach analyzing environmental forces and their most pertinent interests.²⁷⁵ The first level is a macro-analysis that examines the nature, dynamics and influence of policy forces on U.S. and EU public safety and communications policy-making and policies²⁷⁶ shaping E112 and E911 policy guidance, policies and regulation. In recognizing the pertinent forces and dominant interests, we assume U.S. and EU policy-makers preserve domestic and global competition in a single market, assign different weights and priorities to similar policy-

269. 47 U.S.C. § 942 (b).

270. *Id.* § 942 (b)(1).

271. ENHANCE 911 Act of 2004, Pub. L. 108-494, 118 Stat. 3986, 3990 (2004).

272. *Id.* § 106.

273. 47 U.S.C. § 332(d) (2006).

274. Pub. L. 108-494, 118 Stat. 3986, 3991 § 107(a)-(b).

275. *See supra* Part III.C and accompanying notes.

276. *See supra* Part III.C.1 and accompanying notes (describing the nature of policy-forces likely to shape EU and U.S. policy-making for public safety and telecommunications).

making forces and interests, and show appropriate deference to state policies and interests in traditional areas of state and member state government. Moreover, analyzing the fullest impact of any environmental or policy force and its interests on policy-making for public safety and telecommunications is beyond the scope of this article.

On a deeper level, there is a need to analyze the impact of more pertinent force-specific interests. This is based on the public need, or attention given, to limiting government intervention and market restraints. Thus, the second level is a micro-analysis that examines business, government and policy criteria to ascertain the impact of force-specific interests on U.S. and EU policy to establish and implement E112 and E911 regulatory schemes.²⁷⁷ These criteria apply to force-specific interests to determine their most likely prevalence, weight and relevance and their impact on policy guidance, policies and regulation to establish, implement and sustain E911 and E112 regulatory schemes.²⁷⁸ In short, the comparative analytical review is a qualitative analysis of the influence of broad environmental forces, and the impact of narrow force-specific interests on E112 and E911 policy guidance, policies and regulations.

A. *Politics and Social Forces underlying Public Safety and Telecommunications Policy-Making*

Although the emergency call system began in Europe, our focus is on the European Union, which has had a shorter time to establish and implement a regional emergency call number system.²⁷⁹ In the EU, it is not the passage of time alone that explains differences in the E112 policy-making responses, but the rapid development and diffusion of digital cellular and location technologies for wireless emergency call services.²⁸⁰ Finally, tourism, telecommunication commerce and their development have some influence on the EU policy-making, or legislative efforts, to harmonize establishing and implementing E112 among uniquely different cultures in Europe.²⁸¹

1. *Industry and Political Forces in Public Safety Policy-Making*

The EU Commission, Parliament and Council choose not to impose mandatory obligations on member states to protect public safety and privacy interests of its wireless subscribers and callers.²⁸² EU policy-makers also choose to resolve the conflict between economic and social forces, namely

277. See *supra* Part III.C.2 and accompanying notes (describing the nature of force-specific interests impacting EU and U.S. policy-making for public safety and telecommunications).

278. See *supra* Part III.C.2 and accompanying notes.

279. See EU Decisions, 91/396/EEC, *supra* note 6 (establishing 112 as the EU emergency call numbers by requiring member states to insure its implementation).

280. See *id.*

281. See Comm. (88) 312 EU-Standard Emergency Number, *supra* note 142, § I.

282. See Recommendation 2003/558/EC, *supra* note 12, ¶¶ 5-6.

economic growth and public safety, by giving greater weight to the protection of business or technology interests in establishing and implementing E112. The EU's policy choices recognize that the telecommunication industry would suffer an economic hardship by diverting funds and capital from business operations and commercial research and development.²⁸³ In contrast, the LOCUS and CGALIES reports place great emphasis on funding a viable market solution to provide emergency call number services, recognizing that public safety concerns are resolved by regulating telecommunications markets.²⁸⁴ Finally, the EU intervenes in provision of emergency call number services and weighs business and market consequences and public needs to arrive at mere policy guidance that leaves member states considerable flexibility in implementing E112 under only an EU Commission Recommendation.²⁸⁵

In U.S. policy-making, Congress weighs public policy, and market and business interests, charting a different policy course in the design and implementation of E911 subject to regulatory management by the FCC.²⁸⁶ In intergovernmental relations, the fact that one national or regional government starts first can be meaningless. The Hatfield Report points out the shortcomings of U.S. E911 policy design and implementation, although its recommendations were not heeded in Congress, and that FCC policy-making focused on economic and public needs, not business concerns.²⁸⁷ Moreover, American states and their PSAPs may choose to delay, or not implement, state or federal policies while wireless subscribers pay fees and taxes to fund the implementation of E911 policies under federal and state law.²⁸⁸ These states can collect and spend these taxes and fees for purposes other than to implement public safety needs, such as E911.²⁸⁹ Of course, conflict is apparent between social and economic policy-making forces in that American wireless carriers must fund the implementation of emergency number call services.²⁹⁰ In *U.S. Cellular Corp. v. FCC*,²⁹¹ the D.C. Circuit agreed with the FCC that

283. See LOCUS, *supra* note 160, at 12 (finding a market-driven approach to regulating telecom operators/carriers, PSAPs, and member states could be effective in the EU).

284. See *id.* at 12-13 (discussing two implementation options for E112); CGALIES, *supra* note 11, at 33-35 (discussing two implementation scenarios for the E112).

285. See generally Recommendation, 2003/558/EC, *supra* note 12; see *supra* Part III.A.1 and accompanying notes (discussing the enforceability of an EU Recommendation among).

286. See *supra* Part V.B and accompanying notes.

287. See Hatfield, *supra* note 11, at i-v. In ENHANCE Act 2004, Congress attempted to coordinate the involvement of federal agencies, but it did not fund the ENHANCE Act of 2004, so little was done. See 47 U.S.C. § 942(b)(3) (2006).

288. See The Wireless Safety Act of 1999, 47 U.S.C. § 615 (2006). The Act states "[t]he Federal Communications Commission shall encourage and support efforts by States to deploy comprehensive end-to-end emergency communications infrastructure and programs, based on coordinated statewide plans Nothing in this subsection shall be construed to authorize or require the Commission to impose obligations or costs on any person." *Id.*

289. See Squeo, *supra* note 1 at A1.

290. See *supra* Part V.C and accompanying notes (discussing the lack of a cost recovery mechanism on implementing ALI technology).

291. *U.S. Cellular Corp. v. FCC*, 254 F.3d 78, 78 (D.C. Cir. 2001).

subsidizing the deployment of ALI and other technologies would lead to a delay in implementing E911.²⁹²

In reviewing EU and U.S. policies, U.S. regulation of the telecommunications industry, establishing and implementing E911 policies, places less emphasis on business costs and investments provided American wireless carriers are subject to competitively neutral legislative and regulatory schemes. The U.S. public policy does not favor commercialization of telecommunications, rather it seeks immediate policy outcomes of business and markets to further public safety objectives. Unlike the United States, the EU favors a public policy that relies on less intervention in business development and commercial growth of emerging automatic location technologies. Neither U.S. nor EU policy-makers have established a legislative scheme that applies an appropriate balance of public safety and business interests forceful enough to induce or cause states to execute federal or regional policy objectives of E112 and E911. In recognizing that E911 and E112 policy-making is not one stage process, a macro-analytical comparative perspective finds that deference to state governments, and a prolonged reliance on market or legislative initiatives to implement an emergency call services policy must eventually give way to reasonable government mandates imposing public obligations on business organizations, technology manufacturers and state governments.

2. *Technology Costs and Emergency Call Number Interests of Public Safety Policies*

A micro-analytical review finds that EU and U.S. policy guidance, policies and regulation of E112 and E911, respectively, place different weights on emergency call number assistance interests and business costs interests. This different treatment gives states entirely different latitude in providing emergency call number services to their citizens. EU states may not make forceful demands on wireless carriers and operators only required to provide timely, accurate information based on existing technology.²⁹³ EU policy-makers are quite clear on the importance of business development and cost recovery to the growth and competitiveness of the telecommunications industry in a single market and global economy.

The U.S.'s E911 policy appears to give less weight to financial interests, namely capital investments, cost recovery and business development. The United States, however, mandates technology development, deployment and diffusion of location and wireless technologies. The E911 policy imposes public obligations on wireless carriers to develop technology, but does not relate rate of commercialization to any level of public safety benefits. The lack

292. *See id.* at 87.

293. *See* Recommendation 2003/558/EC, *supra* note 12, Art 4 (wireless carriers or telecom operators must provide "best information available as to the location of the caller, to the extent technically feasible").

of commercialization and cost recovery are evidence of little reciprocity between public safety and technology costs, in particular business development and commercialization. U.S. policy-makers should not thwart business development by feigning that wireless subscription fees are sufficient to develop and commercialize new technology, notwithstanding immunity from civil lawsuits.²⁹⁴

U.S. and EU policy-makers and telecommunications industries must each find a regulatory scheme establishing appropriate incentives for commercial investment and timely provisions for public safety needs. Imposing financial costs on wireless subscribers and carriers leaves the states and PSAPs to move slowly and invest last. A micro-analytical review reveals an imbalance in the weights placed on commerce and social welfare interests in making E911 policies that threatens to undermine implementation of state and local E911 regulatory schemes. Global and domestic competition demands legislative and regulatory schemes to apply an appropriate balance between public safety and technology interests to further public safety.

B. Industry and Public Policy Forces underlying Public Safety and Telecommunications Policy-Making

U.S. and EU telecommunications policies have reflected genuine industrial needs and public policy concerns regarding the domestic and global market needs of the telecommunications industry. Yet, this industry must be regulated to provide emergency call number services. The U.S. and EU findings show that business competition and cost interests have been weighed in the provision of social needs, namely public safety services, under telecommunication policies and regulation.²⁹⁵ Economic interests are not confined to regional telecommunication markets involving the survival of the regional or multi-state wireless carriers or operators that acquire and install location information and cellular standards technologies. The U.S. and EU economic environments include global markets and competition for the development, deployment and diffusion of telecommunication equipment, products and services.²⁹⁶

294. See 47 U.S.C. § 615(a) (waiving liability for harm caused by the release or use of location information in emergency situation and thus creating parity among the users or parties involved in providing emergency call number services to the public).

295. See 47 U.S.C. § 251 (2006) (establishing “a rapid, efficient, Nationwide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, for the purpose of promoting safety of life . . .” *Id.*); see Directive 2002/22/EC (indicating “the aim is to ensure the availability throughout the Community of good quality publicly available services through effective competition . . .”). *Id.* art. 1.

296. See generally Communication on Regulatory Framework of Telecommunications, *supra* note 2 (discussing the need for convergence of markets in a single European market).

1. *Social and Economic Forces of Public Safety Policy-Making*

Both EU and U.S. telecommunications policies protect domestic telecommunications markets by encouraging competition, thereby encouraging development, deployment and diffusion of new technologies.²⁹⁷ EU policies to further commercial or business interests are quite straightforward, and its market-driven policy approach prefers commercialization over restrictive regulatory mandates. U.S. public-safety interests simply outweigh economic policy forces and do not alleviate costs or other economic concerns placed on wireless carriers and their business operations in implementing E911 emergency call number services.²⁹⁸

The FCC leaves the economic policy force underpinning profitable business operations, stable marketing strategy of wireless carriers and location-based services providers at the mercy of PSAPs and other state agencies. When PSAPs request compliance with Phase II, they enforce an FCC mandate requiring wireless carriers to deploy and diffuse location technology causing LECs to install routing and other equipment to receive location and cellular data to transmit to PSAPs.²⁹⁹ The FCC's neutral-market policy approach translates into a somewhat weak public policy approach on economic interests other than competition and thus excludes financial costs, return on investment, strategic market planning, research and development programs, meeting global competition, and finding commercial market opportunities for technology.³⁰⁰ Under this U.S. market-neutral policy approach, Congress and the FCC have not created a wireless or telecommunications policy that encourages the rapid and broad development of public and private uses of ALI technology, notwithstanding the ubiquitous nature of E911 and cellular phones.

Commercial use is not entirely forgotten in the Wireless Safety Act, but Congress rightfully goes in the opposite direction by imposing restrictions on the use of ALI technology and disclosure of location information.³⁰¹ Although Congress was silent on encouraging or fostering legitimate commercial uses, Congress does permit wireless subscribers to consent to commercial uses of information obtained with ALI technology and permits wireless carriers to explore commercial uses.³⁰² The commercialization of technology in implementing the E911 emergency call number regulatory scheme is not new.

297. See *supra* Parts IV.B, V.B and accompanying notes (discussing U.S. and EU public safety policy-making involving the telecommunications industry).

298. See U.S. Cellular Corp., 254 F.3d at 83-86 (not permitting cost recovery by wireless carriers for the implementation of the E911).

299. See 47 C.F.R. § 20.18(e) (2006).

300. See U.S. Cellular, 254 F.3d at 86. These carriers had requested the FCC to consider a proposed rule. E911 FCC First Memorandum and Order, *supra* note 23, at 22728-34.

301. See 47 U.S.C. § 222 (2006). Wireless carriers can provide location information "to providers of information or database management services solely for purposes of assisting in the delivery of emergency services in response to an emergency." *Id.* § 222(4)(C).

302. See *id.* § 222.

Wireline and wireless carriers have commercialized Automatic Number Identification (ANI) technology.³⁰³ In many areas, wireline carriers charge subscription fees for the use of caller identification as a home or business telephone service.³⁰⁴ From a macro-analytical perspective, the EU and U.S. responded differently under their respective industry and economic policy forces asserting commercial uses and business development of ALI technologies as a means to hasten implementation of E911.

2. *Commercial and Privacy Interests of Public Safety Policies*

Both EU and U.S. policy-makers recognize that the disclosure and use of location information raise policy concerns regarding the disclosure of private information for unintended purposes.³⁰⁵ The United States and EU addressed privacy concerns by imposing restrictions on wireless carriers to limit disclosure and use other than for emergency services or other legitimate purposes.³⁰⁶ But the United States and EU give subscribers the right to consensual disclosure. This consent furthers an already existing commercial use of GPS locator services in highway vehicles, which permits consumers to find their routes and locations for personal reasons. A similar use for wireless mobile telephones seems no less intrusive to provide location services for wireless subscribers who are walking, riding or sitting.³⁰⁷ Therefore, using location information subject to subscribers' consent and their needs and wants offers opportunities for commercialization and overcomes privacy interests in the United States and EU. However, such consent does not offset other regulatory mandates.

The weight given by EU policy-makers to commercial or business interests in public safety policy-making surpasses that given by U.S. policy-makers to the commercialization of location information. EU employed research committees, namely LOCUS and CGALIES, to consider the commercial impact of establishing and implementing E112 on the business of wireless and location-based service companies.³⁰⁸ EU policy-makers assigned substantially more weight and priority to business finance, business development and market interests. Little emphasis or weight on these interests can represent a substantial burden on paying for new location information technologies, installing new networking equipment by wireless carriers and

303. Alexandra Alger, *How to Screen and Block Calls*, FORBES, July 29, 1996, at 105 (finding the cost of the service was \$5.00 to \$9.00 per month).

304. *Id.*

305. See 47 U.S.C. § 222(c); See Recommendation 2003/558/EC, *supra* note 12, ¶ 2.

306. See 47 U.S.C. § 222; See Recommendation 2005/558/EC, *supra* note 12, ¶ 2.

307. See Zeff, *supra* note 226. Mr. Zeff points out the impact of highly accurate location technology when he states: “[i]nstead of wondering ‘where am I?’ in relationship to ‘where am I going?’ we will ask ‘who or what is within close proximity of my current location?’ . . .” *Id.*

308. See *supra* Part IV.B and accompanying notes (discussing the findings of the LOCUS and CGALIES committees).

finding new markets by location-based services companies. Obviously, the United States chose less emphasis or weight on commercialization.

In our micro-analysis of commercial and privacy interests, the EU and the United States obviously give similar weight to privacy interests but different weight to commercial interests in managing conflicting public safety and telecommunication policy concerns. EU and U.S. policy-makers design different policies and regulations for the provision of a social benefit with commercial potential. Still U.S. and EU public safety policies are not complete, and will not be provided the telecommunications industry continues to produce new technologies, such as VOIP, raising public safety concerns and the possibility of new markets.³⁰⁹

C. Industry and Economic Forces underlying Public Safety Policy-Making and Policies

Telecommunications, information and information management technologies and their domestic business development and regulation comprise the industry and economic forces.³¹⁰ Wireless cellular standard technologies include incompatible technologies that have economic impacts on wireless carriers and location-based services, such as business competition, service and product prices and market share. In the United States, the cellular phone market appears content with several cellular technologies, so the LECs and PSAPs are obligated to prepare and initiate, respectively, E911 services for all types of technologies. U.S. wireless market contentment may protect inefficient ALI technologies that are still considered accurate under business-neutral federal regulation but do not provide any private sector location-based services. Finally, LECs and PSAPs must prepare for any and all technologies. In the EU, the policy-makers' preference for the GSM cellular standard creates less need to consider competing cellular technologies. There remains the need for accurate and reliable location information, however, which creates the need to consider the development of automatic handset and network location technologies.³¹¹ The EU and U.S. policy-making for the telecommunications industry recognizes competition among wireless carriers, and other telecommunication services and products provide a highly important economic or market interest in single EU and U.S. markets.³¹² In short, economic and

309. See E-911 Regulation, *supra* note 127, at 125-26; Squeo, *supra* note 1, at A1; see also FCC, Voice-Over-Internet Protocol, <http://www.fcc.gov/voip> (last visited Apr. 23, 2008) (noting the FCC regulates VOIP to insure that E911 services are available).

310. See *supra* Part III.C.1 and accompanying notes (describing the policy-making forces of macro analytical framework to review EU and U.S. emergency call number policies).

311. See CGALIES, *supra* note 11, at 28 (discussing the feasibility of location technologies in the EU policy-making for E112).

312. See Communication on Regulatory Framework of Telecommunications, *supra* note 2, at 39 (citing COM (2005) 24 02.02.2005); Communication to the Spring European Council, Working Together for Growth and Jobs A New Start for the Lisbon Strategy, COM (2005) 24

industry forces play major roles in shaping the design and implementation of EU and U.S. emergency number call services policies.

1. *Economic and Industry Forces of Public Safety Policy-Making*

Economic and industry forces impact in some degree U.S. public safety policy requiring the development, deployment and diffusion of wireless standards, location information and other technologies to implement E911 regulatory schemes and emergency center and PSAP operations. These forces involve the capability of wireless carriers to comply with FCC location requirements, meet domestic competition in the diffusion of location-based, wireless and other information services, manage business operational and capital needs in complying with regulatory requirements, and perhaps, establish business development and operations to compete in global markets. Developing E112 and E911 policies and regulation has required U.S. and EU policy-makers to address industry and economic forces, such as technology and business, respectively. For example, the United States and EU have considered accuracy standards for location information technologies. When any ALI technology is not accurate enough under EU and U.S. standards, this technology must be replaced with more accurate technology.³¹³ For example, networked-based location technology determines the location of subscribers by triangulation. But, this technology cannot provide a subscriber's location by triangulation when wireless carriers place cellular towers in a straight line.³¹⁴ Similarly, it is well-settled that technology can become too costly and too inefficient, or will face logical obsolescence becoming inaccurate for government mandates or commercial uses. The EU focuses on commercialization of location information technology and commercialization should strongly favor the timely replacement of inaccurate ALI technologies, changing to more efficient technologies.³¹⁵ In fact, the EU's policy to "provide [the] best information available"³¹⁶ is flexible, and should encourage improvements in location information technology provided to PSAPs as telecom and network operators develop location-based services and other commercial applications. This impact of commercialization may not happen in the United States, though both the U.S. and EU expect PSAPs and LECs to interface or operate with accurate ALI technology under regional and state

(Feb. 2, 2005) (describing communication from President Barroso in agreement with Vice-President Verheugen. EU legislative policy-makers recognized that creating a "competitive internal market is a challenge. . .").

313. See 47 C.F.R. § 20.18.

314. See *supra* Part III.B.1 and accompanying notes (discussing the various kinds of location information technology).

315. See *supra* Part IV.B.2 and accompanying notes (explaining the CGALIES Report and its finding on business markets and public policy).

316. See Recommendation 2003/558/EC, *supra* note 12, Art. 4 (indicating wireless carriers or telecom operators must provide the "best information available as to the location of the caller, to the extent technically feasible").

regulations.³¹⁷

Other location and accuracy mandates may greatly increase operating costs and diminish returns on capital investments in highly competitive markets. Business investments in cellular and location technologies solely for public safety needs may be less attractive operational and capital investments, even under FCC mandates. Moreover, network-based location methods will increase operating or capital costs when wireless carriers must relocate towers solely to comply with the FCC accuracy standards for location methods relying exclusively on triangulation.³¹⁸ Relocating these towers would likely yield no new profits but may decrease competitiveness of smaller carriers forced to compete with handset technology when more efficient network and handset technologies can offer location-based services. On one hand, U.S. industry and economic forces must respond to statutory and regulatory obligations. These mandates are an external priority on business and industry operations and objectives. This mandated business priority strongly influences the response of industrial and business organizations to new operational and market opportunities, such as finding uses and markets for location-based services.³¹⁹ On the other hand, the EU's market-driven approach weighs industry and its technology interests harmonizing business or economic and public needs to encourage wireless carriers and operators to provide emergency call number services and respond to business opportunities in establishing location-based services in a single market.

2. *Technology and Business Internets of Public Safety Policies*

Economic and industry forces and their underlying business and technology interests account for several differences in the EU and U.S. enhanced wireless call number policies. In the EU, the dominant industry and economic interests are business, markets, and ALI technology. In the EU, both LOCUS and CGALIES discuss economic and industry policy concerns regarding the impact of imposing regulation or public obligations on wireless carriers and location-based markets. These concerns involve business costs, capital investments, business development and other interests.³²⁰ Next, another EU policy choice shows the positive impact of technology and business or market interests on E112 policy-making. The EU's preference for one

317. See 47 C.F.R. § 20.18; EU Commission Recommendation 2003/558/EC, *supra* note 12, Art. 4.

318. See *U.S. Cellular Corp. v. FCC*, 254 F.3d 78, 81-82 (D.C. Cir. 2001) (discussing the plight of small rural carriers that needed the cost recovery mechanism to sparsely populated rural markets).

319. See *supra* Part II.A.2 and accompanying notes (discussing the policy guidance or business-market approach to implementing enhanced emergency call services).

320. See LOCUS, *supra* note 160, at 12-13 (discussing market-driven option for implementing E112); CGALIES, *supra* note 11, at 33-35 (discussing market-driven scenarios for implementing E112).

dominant wireless standard, namely GSM, reduces business costs, interoperability problems and compatible standards in the interface of telecommunications equipment in transmitting E112 calls, such as relaying and routing various digital signals from wireless carriers through LECs to PSAPs.³²¹

A general micro-analytical review indicates that business and technology interests are significant, not normally in conflict and important in domestic markets.

Although the United States considers industry and economic forces, it places less emphasis on furthering business and technology interests in making E911 policies. The United States proffers competition-neutral FCC regulations that support multiple technologies, give consumer more choices and increase market competition. U.S. business and technology concerns receive less weight than public safety needs in E911 policy-making, thus subjecting business, technology and market interests to mandatory regulation. Although wireless carriers are given the authority to impose fees to provide E911 services, wireless carriers still must incur the business costs of developing, deploying, and diffusing wireless, location information and other technologies to provide E911 services to their subscribers.³²² Congress and the FCC do not favor the commercialization of ALI technologies as means to hasten the implementation E911, thus placing little legislative emphasis on making location-based services widely available in the U.S. A general micro-analytical review shows that business and technology interests are avoided by making neutral legislation and regulations and imposing mandates on the cellular phone and other industries, instead such interests are considered on a case-by-case basis in granting waivers in domestic markets.

VII. CONCLUSION

Establishing and implementing enhanced wireless emergency call systems under U.S. telecommunication policy preserves interstate competition and under EU telecommunication policy creates inter-European competition. Thereafter, U.S. and EU policy forces and underlying interests are accorded different weights or priorities in making and furthering public safety policies and harmonizing public safety needs with telecommunication interests and policies. Finally, EU and U.S. policy-makers show a deferential or reluctant comity to sovereign states that must eventually establish and implement

321. See CGALIES, *supra* note 11, at 29-32 (discussing the cost of implementing E112, including who will pay for the location services).

322. See U.S. Cellular Corp., 254 F.3d at 78 (declining to permit cost recovery by wireless carriers for the implementation of the E911). U.S. wireless carriers can also petition the FCC and request a waiver from compliance with FCC rules for implementation of E911. See ENHANCE 911 Act of 2004, Pub. L. No. 108-494, 106, 118 Stat. 3986, 3990 (2004) (recognizing that the FCC had been granting waiver and requiring the FCC to report these waivers to the Committee on Energy and Commerce of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate).

enhanced emergency call number services systems. These states must create and manage PSAPs, which connect with wireless carriers and LECs that must use telecommunications technology to transmit timely and accurate emergency calls by wireless subscribers.

U.S. and EU industry, political, economic, public policy and social forces and their underlying interests create differences in EU and U.S. policy guidance, policies and regulation. The United States favors strong industry competition, robust technology development and forceful private obligations. U.S. public safety policy or E911 depends on an effective telecommunications policy that imposes obligations or mandates on wireless carriers and LECs and encourages participation by state and local governments. Imposing private obligations on wireless carriers and LECs to enhance emergency call services, while leaving PSAPs and states to trigger these obligations leaves federal public policy at the mercy of state politics and interests. The U.S. regulatory scheme for E911 forces a narrow or particular policy outcome that is only subject to FCC waivers for business or technical grounds.

In contrast, EU public safety policy does not share the U.S. preference for public mandates and primarily leaves the authority to impose public obligations to the member states. The LOCUS and CGALIES reports show concern for the telecommunication industry that plays a quintessential role in developing, deploying and diffusing new wireless standard and ALI technologies. EU policies weigh the impact of implementing E112 on business and markets and support the commercialization of ALI technology. EU policy-making favors a single wireless standard, supports diverse location information technologies and provides flexible policies to its member states. EU policy-making is a business market approach that places weight on public policy, social and political needs, but gives substantially more weight to industry and economic concerns.

EU and U.S. policies and regulations establish and implement E112 and E911, respectively, but contain unique differences in their approaches to the provision of public safety benefits for their citizens and the impact on the telecommunications industry. United States policy does not favor one cellular standard, but preserves competition among several wireless carriers using one or more cellular standards. The EU accepts a single or dominant standard in transmitting location information. Next, the EU and United States take different approaches in their regulation of location information technology. EU policy-makers want location-based service companies to commercialize location information technology, while wireless carriers use their best efforts to provide accurate and timely location information to PSAPs. U.S. policy-makers do not show much, if any, interest in commercializing location-based technology and routinely settle to obligate wireless carriers to provide location information and incur the technology development, deployment and diffusion costs.³²³ U.S. and EU policies for E911 and E112, respectively, assign different

323. See *supra* Parts IV, V and accompanying notes (discussing EU and U.S. legislative policies and regulation to implement E911).

weights and priorities to almost identical policy forces and nearly similar force-specific interests, such as public safety, commercialization, business development and industry competition.