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INITIATING ROAD SAFETY POLICY THROUGH PARTICIPATION: A SUCCESSFUL EXPERIENCE WITH A CHILEAN METHODOLOGY

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ABSTRACT

This paper describes the process and methods through which Chile’s first National Road Safety Policy was formulated in the mid-1990’s and provides an explanation for its success. This policy saved several thousand people from death or injuries and established strong bases for continued, multi-agency and multi-disciplinary work on road safety. Such bases did survive a period with no political interest in road safety and reduced support to it.

For any leader in a developing country ministry who decides to undertake a serious policy making process on road safety, the first shock comes from the high complexity of the task ahead. Transport, health, police, justice, urban, education, public works and other authorities must be involved. Medicine, law, engineering, psychology, journalism, police sciences, management, pedagogy and other disciplines are needed to understand the issues and to define what is to be done. Transport companies, newspapers, television, municipalities, universities, schools, bus drivers unions and a host of additional actors should be attracted to contribute and to perform new activities. The measures that could be taken are technically known, from international experience, but every design situation and implementation process is unique. And the prevailing culture is never helpful since it explains traffic-related deaths and injuries as deeds of fate. Where could the leader start from?

This paper makes known the foundations, concepts, methods and concrete steps that were used for the formulation of Chile’s Policy, which started from the situation just described. As shown in the title, it was a public policy process based on participation. We must add that it was deliberate and systematic, with well-specified theory, methods and managerial tools. Theory corresponds to the “Complexity-Participation Principle” and the methodology is called “Participatory Innovation”; both belong to social systems thinking and have been developed by the current author through research and applications in many fields, over a number of years. The same methodology is currently being used for updating the Chilean Policy to the needs and realities of 2007.

1 CONTRASTING SITUATIONS OVER A DECADE

In the mid-1990’s Chile’s road traffic showed alarming growth in the number of dead and injured people. Only two actors were present in the safety field, Carabineros de Chile, the uniformed police, and the Local Police Judges. Language was loaded with terms such as accident, infraction, fine or suspension of driver’s license. Although Carabineros did carry out education campaigns, its fundamental action was enforcement. And that of the Judges, to penalize infractions. A simple assumption seemed to operate in the official culture: drivers are to blame for accidents. And the action strategy followed: “hit the drivers hard”.

Ten years later, as a consequence of the first National Road Safety Policy, the assumptions of road traffic culture were no longer so simple, but included many additional themes. A wide and diverse group of new actors had appeared on stage, such as transport engineers,

physicians, psychologists, teachers, firemen, journalists, mayors, bus drivers, transport companies, equipment suppliers, university researchers and NGOs. Their language was richer and more sophisticated. And the action strategy covered nine fronts at the same time. What was the impact of all this? That the growing trend had not only been stopped but reversed, and the absolute number of dead and injured persons was falling year after year.

2 THE CENTRAL IMPACT: THOUSANDS OF LIVES SAVED

Figure 1 helps to appreciate the policy-related process that took place in Chile. Deaths in road traffic were growing from 1,000 in the mid-1980's to almost 2,000 by the mid 1990's, in a population of around 15,000,000. The National Road Safety Policy was formulated between 1993 and 1995. Only two years later the trend had been reversed and the total number of fatalities had started to fall. It went down to fewer than 1,600, although it did come up later to some extent. Was this impact a consequence of economic or other kind of factors? Not at all. The process took place while Chile was undergoing strong economic growth, with the corresponding increases in the number of vehicles, journeys and passengers. This fact comes up clearly by comparing the trend in road fatalities with the trend of GDP growth.

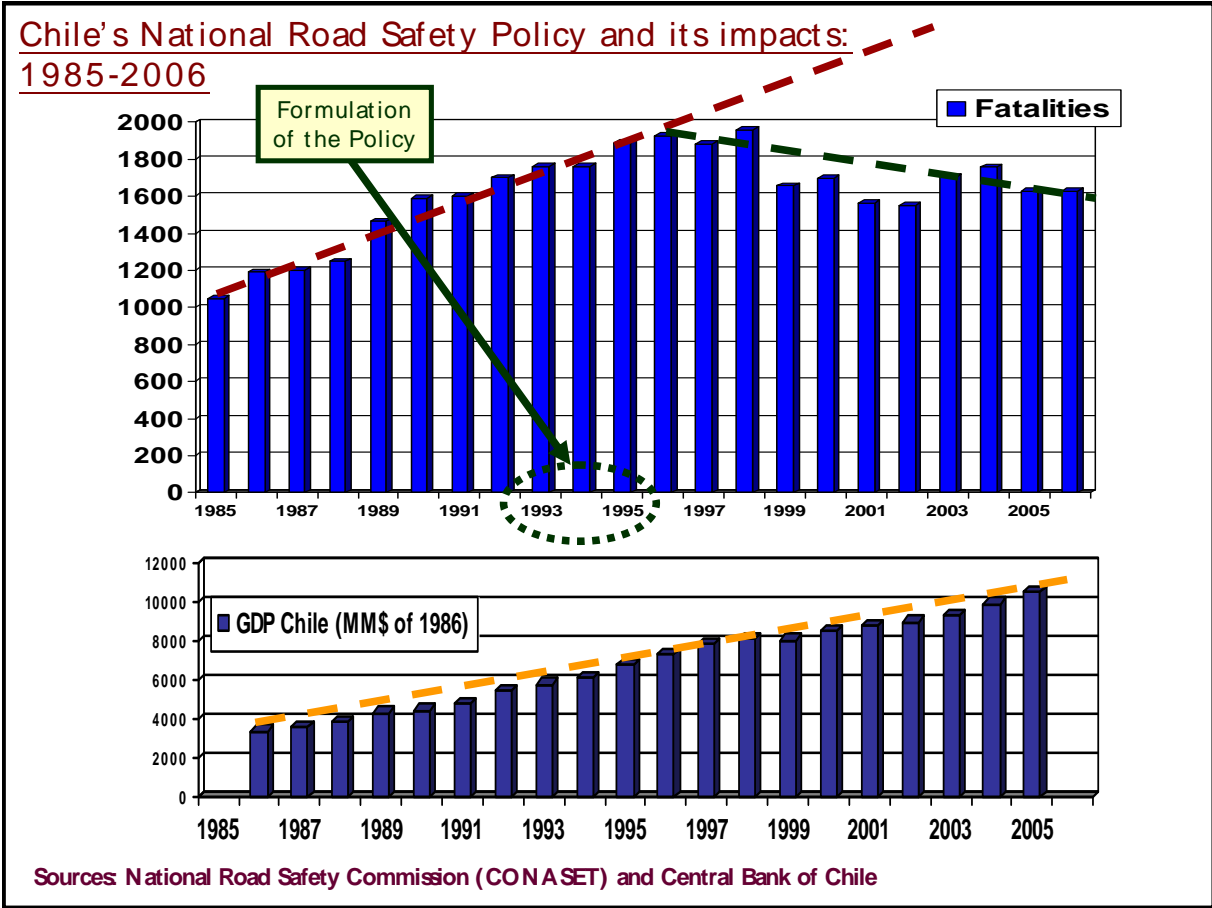


Figure 1: Chile's National Road Safety Policy and its Impacts, 1985-2006.

A simple estimate, by comparing the historical figures with the linear projection of Figure 1, shows that in Chile some 6,000 human lives were saved as a consequence of this Policy. Besides, injuries were avoided to 60,000 people, as well as high material costs in vehicles, health services and other elements that are well known.

3 CONCEPTUAL GROUNDS: THE COMPLEXITY-PARTICIPATION PRINCIPLE

3.1 Facing road-safety policy situations in practice

Consider a minister of health or transport interested in setting up a sustainable process of road safety improvement in a developing country, in which there is limited experience in this field and no agency in charge. She faces a situation we characterize as “high complexity”, which typically involves: (a) a large number of inter-related issues; (b) a large number of inter-related actors, with or without conflicts among them; (c) a large number of inter-dependent actions to be undertaken; (d) a large number of relevant disciplines and professions, with their peculiar languages and methods; and (e) several non-communicated cultures at play, such as the political, the academic, the business and the labor ones.

How would she start working? According to common sense, she would: (a) use experts, consultants, surveys and analyses of varied sorts as her sources of knowledge, and (b) take one or two highly-visible measures like seat-belt or speeding penalization and enforcement, with the support of a strong media campaign. Notice that this approach deals with the complexity of the situation by *simplifying* it, in order to make it manageable. She does not cover the whole situation, but just what she believes she can handle.

Will this approach work for the long run? Unfortunately not, since the next minister, who needs to differentiate in order to survive politically, will not support the same measures and may launch his own ones, but only if he feels that road safety is still attractive at all. It is easy to realize that this experience will also leave a strong sense of frustration among those who were involved, and may postpone any attention to the subject for another decade. As an exception the common sense approach could leave permanent professional capacities established, with autonomous funding sources, but this is certainly not the rule.

3.2 The key to an alternative approach

Running against common sense, the key to an alternative –and highly effective– approach is not to simplify but rather to *deal with the whole complexity of the situation*. This is practically possible, as will be shown presently. But we need to notice first what is the actual effect of simplifying the real world for dealing with it. By doing so the policy maker will disregard actors that could be her allies, will disregard aspects of road safety that could make other aspects feasible, will miss the opportunity of presenting road safety as the deep cultural lack it in fact is, and will miss the subtle flavor of the details, nuances and cultural insights that make things work in practice. The common sense approach is not able to *describe* the real world as it actually is. It lacks descriptive capacity, or, in the technical terms of the systems sciences, it lacks *requisite variety* (Ashby, 1956).

The alternative way to start is easy to grasp intuitively. It is based on the clear fact that no one can better describe the elements that make up the real world as it is –both subtle and rough– than the people who experience them day after day and know them from practice. In the alternative approach the policy maker would: (a) use the real-world actors as the key source of knowledge, along with experts for technical issues, and (b) take a large number of measures at the same time, so as to cover the road safety field as widely as possible. Her policy-making process would apply effective methods to elicit the actors’ knowledge, to systematize it and to convert it into effective action. The author has in fact developed such *high-variety* methods and tools and has applied them extensively in a large number of fields (Del Valle 1992, 1999, 2002). They do have a high descriptive capacity because of their built-in logic, and because they use the most powerful instrument for dealing with nuances, details and insights, which is human language.

3.3 Stating the Principle

The above discussion may be synthesized by means of a theoretical principle, which we call the Complexity-Participation Principle. Its general statement is: High-complexity situations in the real world can be effectively understood and managed through processes of methodical participation by the actors involved.

For the specific purpose of building up public policies, the Principle may be stated more precisely as follows: It is possible to generate high-quality public policies, i.e., policies that are both effective and legitimate, and have desirable cultural impacts, if this is done through *strong participation* and under well-specified conditions for three key factors of any policy, i.e., *understanding*, *leadership* and *method*. These factors are shown on Figure 2. We present now the conditions that should be met for each factor, geared to road safety, along with our definition of strong participation.

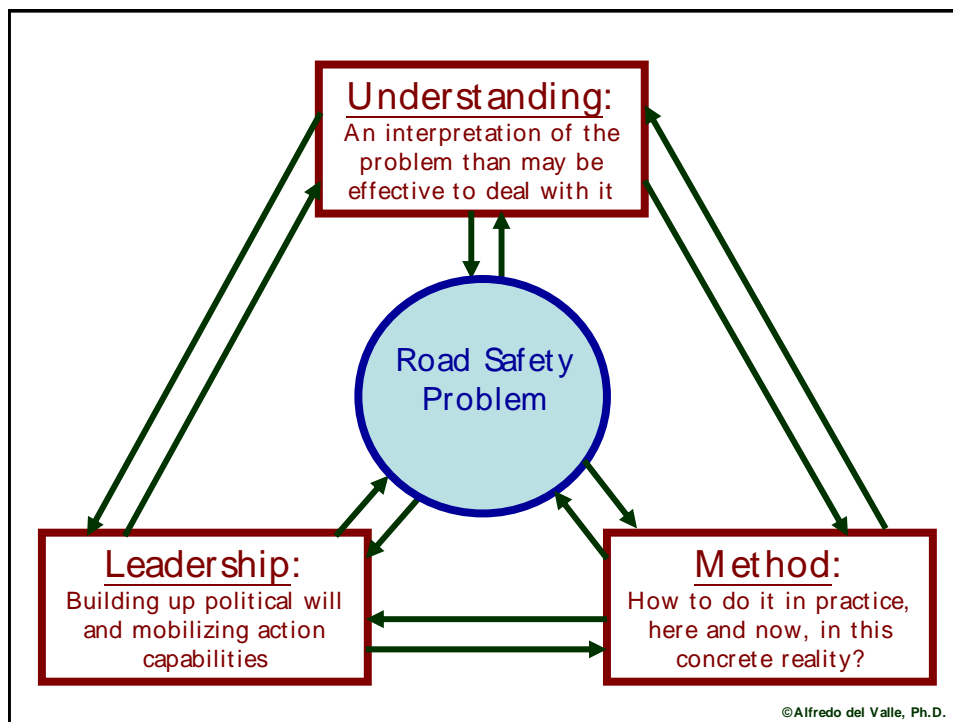


Figure 2: The key factors of any public policy.

3.4 Conditions for “understanding”

Understanding has to do with the interpretation of the issue at hand. It is usual to understand road safety as a field in which people, roads and vehicles interact physically. This is appropriate, of course, for the technical design of vehicles, roads and protection systems. But is hardly so for the design of comprehensive policies. The relevant entities that interact in this case are ministries, transport companies, police corps, municipalities, newspapers and the like, and they interact in political, social, economic and cultural ways, rather than physical ways. For effective policy making, road safety must be understood as this complex field of real-world and influential actors, who do or do not prepare the conditions under which the physical interactions on the roads will be safe. This understanding should consider multiple dimensions, search for a diversity of factors, consider qualitative aspects and focus upon interactions. It is not effective to assume mechanistic processes, to simplify, to look only for the main causes, to ignore what is not yet clear, to ignore what is not yet measured, to ignore the interactions or to prioritize before having strong grounds for doing so.

3.5 Conditions for “leadership”

Leadership is related to building up political will and mobilizing the relevant action capabilities. Effective leadership in this context can only be achieved through an enabling style, which may broaden the participants’ power and may be open, facilitating and inclusive. It is clearly not effective a style that is dominant, controlling, centralizing, exclusive and technocratic.

3.6 Conditions for “method”

The question of method is how to do it in practice, here and now, in this concrete reality. It is necessary to have available multi-disciplinary concepts, techniques and tools, which may be able to process high complexity, to generate comprehensive visions of the field of action, to handle the relationships among components, to make use of all available knowledge and to motivate the actors to contribute. It is not effective to use single-discipline methods, or methods that break the problem down into parts, deal with the parts separately, consider only “technical” visions or prefer analysis to action.

3.7 “Strong” participation

Notice that the common usage of the term participation refers to situations such as attending some event, being consulted about some specific subject, voting among some alternatives, being present at an assembly or being a member of a focus group. They are all instances of *weak participation*, in which the ground has been defined in advance by others and the individual has no chance of making any significant difference. *Strong participation*, on the contrary, is what happens when people are convened to give opinion or to be researched upon, but to create, in a context of free and effective interaction with other people similarly convened. In shorter terms, we understand it as *interactive co-creation* of reality by its relevant actors. It is a process that multiplies capabilities, enriches ideas, humanizes and dignifies people. With appropriate methods and tools it may be realistic, effective and very attractive for its actors.

4 PRACTICE: THE “PARTICIPATORY INNOVATION” METHODOLOGY

This methodology involves a set of concepts, methods, techniques and tools, on which the author has worked over 25 years. Applications have been made in fields beyond road safety, such as energy, the environment, technology, urban development and education. In practical applications we use a specialized type of facilitation, called *animation*, and three special tools, the *Action Map*, the *Potentiality Profile* and the Internet-based *Participatory Workspace*. These elements help to unleash intuitions methodically and to systematize them interactively, and make it possible to be efficient in handling high levels of complexity.

In Participatory Innovation a public policy is designed in four methodological steps, which may have variations according to context. They are:

4.1 Integral conception and constitution of a convening capacity

The public policy process is *convened* by a high-level group of actors, who may jointly cover thematically the whole field of action and provide legitimacy to the process. In this first step a basic conception of the process –which respects its complexity– is proposed, the actors who could convene it are identified, a *convening group* is formally established and this group takes over the strategic management of the process. The key practical tasks of the conveners are to select the actors that will participate in the process, to define implementation priorities and to contribute to the design of the management system.

4.2 Creation of the Vision of Development

In this step an attractive and viable vision of the future of road safety in the country is created, on the basis of its current reality. It arises from the knowledge, experience and visions of the actors. It is practical, action-oriented and content-rich. It organizes road safety in its whole complexity, makes it manageable and facilitates the motivation and commitment of the actors to build up such a future. It diagnoses the current level of development. It is carried out through a workshop of 25-30 participants and a few seminars with 100 or more participants, by using the *Action Map* tool and its building techniques.

4.3 Identification of Potentialities

The set of projects that could be undertaken, in order to achieve the level envisaged in the Vision of Development, is identified and defined conceptually in this step. Implementation priorities are also proposed. Participants use the methodology's concept of *Potentiality*, which refers to the sustainable action capacity that lies behind any successful innovation. They do so in a series of methodical workshops that may involve hundreds of participants and may identify hundreds of potentialities. Each project is defined conceptually in a methodical session with people who know its subject in depth, in which a *Potentiality Profile* is prepared.

4.4 Design of the management system

In this final step a methodical design is prepared for a management model and a permanent managerial instance, that may effectively implement the priority projects, and may ensure that innovation will continue taking place in the future. Its contents come from the preceding steps and its outputs involve: policies and management criteria, structure of responsibilities and mechanisms for follow-up, evaluation and re-programming. Once implementation starts, this management system takes over the duties of the convening group.

4.5 Cultural change: The intangible outputs

We should add that the above steps yield not only the *tangible outputs* that were just described. They also produce a key set of *intangible outputs* that belong to the cultural sphere and are essential for the success and sustainability of any high-complexity process. Such outputs are: an integrating language, awareness of the potential, motivation, consensus, trust, leaderships, alliances, networks and permanent innovation capacities. As a practical way for strengthening such outputs and facilitating the whole process, all participants are often linked together on line, through an inter-personal network supported by the *Participatory Workspace* tool.

5 THE EXPERIENCE: CHILE'S NATIONAL ROAD SAFETY POLICY

We shall now review briefly the concrete conditions that were present and the specific actions that were taken in the design process of this Policy, in the Chile of the mid-1990's. The prevailing culture of transit was already mentioned at the beginning of the paper. We shall focus on the chief themes of the two preceding sections.

5.1 Understanding, leadership and method

A circumstance that facilitated the design of this Policy was the fact that the person who had the political *leadership* of the transport sector in Chile, i.e., the Undersecretary of Transport, had at the same time a good *understanding* of the complexity of road safety, since he had previously done research into this subject at University of Chile. This made him receptive to the *method* that was proposed, and subsequently made available, by the present author.

5.2 Convening the process: The Inter-Ministerial Road Safety Commission

The Undersecretary's understanding of the field and leadership position had led him to set up a high-level Commission to provide grounds for a road safety policy, to which he invited nine ministries (Interior, Presidency, Communications, Education, Justice, Public Works, Health, Urban Development and Transport) and Carabineros de Chile, the uniformed police. Once the Participatory Innovation methods started to be applied, the original role of this Commission was expanded to that of a *convening group*.

5.3 Conception: The National Road Safety System

At the beginning of the methodical work the author proposed the Commission to change its initial focus, geared to the analysis of accidents, and to concentrate upon the construction of a *National Road Safety System*. This was to be understood as a complex system in which many interested actors would participate, by contributing their ideas, projects and actions, from their peculiar points of view. The proposal was accepted.

5.4 Vision of development: The Action Map of the system

The Commission itself, in a series of sessions, formulated the first version of the Action Map of the National Road Safety System. It then convened a representative group, of some 120 people, to participate in a seminar in order to validate and enrich the Map. The Map created by the seminar, which is presented on Figure 3, provided the working bases for all the initiatives that were subsequently undertaken under the National Road Safety Policy.

Action Map (1993):		
<u>THE NATIONAL ROAD SAFETY SYSTEM OF CHILE</u>		
<p>A Training and certification of drivers</p> <ul style="list-style-type: none"> A-1 Training professional drivers A-2 Training particular drivers A-3 CERTIFICATION OF DRIVERS A-4 Training driving instructors A-5 CERTIFICATION OF INSTRUCTORS A-6 Certification of examiners A-7 CONTROL OF DRIVING SCHOOLS A-8 Permanent qualification of drivers <p>B Management of vehicle quality</p> <ul style="list-style-type: none"> B-1 Technical specifications B-2 Safety equipment B-3 Certification of new vehicles B-4 Effective technical inspection B-5 Control of inspection plants B-6 Control de maintenance workshops B-7 Training of mechanics <p>C Management of roads and public spaces</p> <ul style="list-style-type: none"> C-1 Traffic management C-2 Management of traffic signals C-3 Updating of designs C-4 Maintenance C-5 Road safety implements C-6 Stops and rest areas C-7 Facilities for pedestrians C-8 Facilities for cyclists C-9 Location of activities 	<p>D Management of transport services</p> <ul style="list-style-type: none"> D-1 Compensation regime D-2 Working hours and conditions of service D-3 Permanent qualification of drivers D-4 Stowage and dangerous loads D-5 School transport conditions <p>E Enforcement</p> <ul style="list-style-type: none"> E-1 CONTROL OF DRIVERS E-2 Inspection of vehicles E-3 Inspection of road conditions E-4 Control of transport services E-5 Control of pedestrians E-6 Enforcement by the citizens <p>F Judicial Action</p> <ul style="list-style-type: none"> F-1 PENALIZING INFRACTIONS F-2 Effective system of penalties F-3 Broadening competences of local judges F-4 Administrative decongestion of lower courts F-5 ACCIDENT INVESTIGATION AND EXPERT REPORTING F-7 Civil accountability of the State 	<p>G Accident care and insurance</p> <ul style="list-style-type: none"> G-1 Integrated rescue system G-2 Integrated rehabilitation system G-3 Insurance coverage <p>H Research and information</p> <ul style="list-style-type: none"> H-1 Integrated information system H-2 REGISTER OF DRIVERS AND OFFENDERS H-3 REGISTER OF VEHICLES H-4 Register of accidents H-5 Register de instructors and examiners H-6 Studies of accident-producing factors H-7 Effective information to users <p>I Education and communications</p> <ul style="list-style-type: none"> I-1 Incorporation into the al curriculum I-2 Training of teachers I-3 Preparation de of teaching material I-4 Protection of school children I-5 DISSEMINATION CAMPAIGNS

Figure 3: The Action Map of Chile's National Road Safety System (1993)

The Action Map is a blueprint of the real-world system the participants want to build up. Its components are called *lines of action*. They correspond to areas of reality in which there are, or there could be, permanent actors with their activities and objectives. Lines are parallel and should be understood as inter-dependent actions. There are two kinds, *basic*, which are on boldface, and *specific*, the remaining ones that provide content and precision to the basic. This map has 9 basic lines of action and 57 specific lines. A line of action may or may not be *established*, i.e., have at present actors with their activities which make impact. The established lines are presented in upper case letters. As it may be noticed, only nine specific lines of action were regarded as established by the participants, and no basic one. The great task of building up the system is described on the map as “bringing to upper case letters” the remaining lines, and this is achieved in practice by designing and implementing a number of inter-related innovations.

5.5 Management system: The creation of CONASET

The management system and the first formal statement of the Policy were established prior to identifying potentialities and designing projects, because the government was about to complete its term and the Undersecretary needed to leave this step consolidated. In the final Policy document (Inter-Ministerial Commission for Road Safety, 1994) the *Action Map* is the central structure with its nine basic lines, and provides clear grounds for: (a) diagnosing the prevailing institutional weakness, (b) defining strategic objectives, (c) identifying a first set of measures, (d) specifying future working groups for the systematic definition of projects, and even (f) classifying the available material and international experiences. The National Road Safety Commission, CONASET, was formally created at the end of 1993, as an inter-ministerial entity to advise the President of the Republic, and started operations in March 1994. It consists of a Committee of Ministers, whose members are the same as the original group, and an Executive Secretariat. The internal organization of the Secretariat also reflected from the start the structure of the Action Map.

5.6 The Potentialities for improving road safety

One of the first tasks of CONASET was the organization of the *Potentialities* process, which worked by means of some 30 methodical workshops and lasted about one year. It had more than 200 active participants and identified 129 potentialities. Each of them was presented by means of a rigorous name, a technical description, an action proposal and a list of interested actors. The report (CONASET, 1995) became a permanent consultation source.

5.7 Implementation

Implementation of the Policy consisted, naturally, in prioritizing the *potentialities*, designing the corresponding projects technically, seeking the required political and financial support, and starting them up. Tables 1, 2 and 3 show, for each basic line of action, the projects that had been implemented by the end of 2004, including those carried out in a different way than envisaged at the beginning. The key source is a ten-year evaluation report prepared by CONASET (2004). The tables also compare the number of projects actually implemented with the total number identified at the initial exercise en 1994-95.

Table 1: Projects with full, high or medium degree of implementation: Line A

A. Training and certification of drivers	Identified: 9	Implemented: 2
Formulation of principles for responsible behavior in road traffic		
Development of a manual for the competent driver		
Sources: CONASET (1995), CONASET 2004 and Urzúa (2006).		

Table 2: Projects with full, high or medium degree of implementation: Lines B to F

B. Management of vehicle quality	Identified: 17	Implemented: 14
Formulation and application of an official norm for light vehicles Formulation and application of an official norm for heavy vehicles Formulation and application of an official norm for two- and three-wheel vehicles Ban on the circulation of hand-made, non-certified vehicles Norm on day-time running lights Regulation of the circulation of special vehicles Norm on information plate in passenger transport to facilitate user complaints Correction of tax distortions against vehicle safety equipment (“tax on luxury”) Correction of tax distortions favoring inadequate vehicles for urban traffic National certification of technical inspection mechanics Legal specification of fraud situations in technical inspection High penalties for circulation without approved technical inspection Use and extension of tax incentives for training transport companies and fleets Norm on safety equipment for children in light vehicles		
C. Management of roads and public spaces	Identified: 27	Implemented: 17
Formulation of safety criteria for design and operation of roads and public spaces Homogenization of terminology among ministries, municipalities and other Development of the responsibility for safety management in primary and secondary road networks Traffic management training programs Treatment of black spots with low-cost measures Methodology for incorporating road safety components into road-impact and urban-impact studies Improving and enforcing norms for protection of inter-urban corridors Recovery of role and safety conditions in high-risk sections of inter-urban roads Treatment of settlements or urban areas that became degraded because of vehicle-flow pressure Gradual decentralization to municipalities of urban road repair works Improvement of safety norms for repair work in roads and public spaces Improvement and application of norm on criteria for signaling Development of norm on facilities for handicapped persons Development of norm on urban publicity to avoid visual and circulation interferences Development of norm and creation of awareness about visual obstacles Authorization to municipalities to confiscate and auction off unattended animals on public roads Development of norm on design and installation of street humps		
D. Management of transport services	Identified: 18	Implemented: 10
Control of driving hours Network of rest, service and security areas for trucks in highways Regulation of circulation, loading and unloading of trucks in urban areas Design of expeditious system for passenger information and complaints Mandatory safety belt and anchored seats for inter-urban buses Separation of driving and collecting in urban buses Design of a new compensation system for urban bus drivers to avoid street races and promote quality Habilitation of bus terminals for urban passenger services Taking and leaving school children inside schools Mandatory safety belt for children in school transport		
E. Enforcement	Identified: 9	Implemented: 2
Identification of up-to-date enforcement techniques Implementation of breath alcohol testing		
F. Judicial action	Identified: 9	Implemented: 7
Revision of the penalties system to induce safety behavior through its intimidatory capacity Development of re-education programs as sanctions Effective procedure for sanctioning driving without license or with suspended or cancelled license Revision and updating of the procedure for accumulation of infractions Mechanism for expeditious consultation and updating of the registries of drivers and vehicles Simplification of procedure in accusation for simple infraction Mandatory alcohol test for drivers involved in traffic accidents		
Sources: CONASET (1995), CONASET 2004 and Urzúa (2006).		

Table 3: Projects with full, high or medium degree of implementation: Lines G to I

G. Accident care and insurance	Identified: 12	Implemented: 8
Manual for coordinating procedures in integrated rescue operations Integrated rescue training program Updating and dissemination of maps of emergency medical care units Development of medical regulation of rescue and transfer Public dissemination program about behavior at accidents Assessment of effectiveness and procedures of the existing mandatory insurance Expansion of coverage of the mandatory insurance to total costs of rescue and rehabilitation Disconnection of indemnity for death and medical expenses in mandatory insurance		
H. Research and information	Identified: 14	Implemented: 9
Regularization of vehicle ownership records and permanent updating of home addresses Geographical focusing of traffic accident statistics Information to facilitate collection of mandatory insurance for care in health institutions Incorporation of road safety contents in professional curricula Computerized documentation centre on road safety Development of graduate studies on road safety Periodical seminars and conferences on road safety research System for follow-up of measures and evaluation of impacts Assessment of accident-related factors of origin		
I. Education and communications	Identified: 14	Implemented: 7
Incorporation of the principles for responsible behavior in road traffic into school curricula Training of teachers in road safety Development of teaching material Promotion of use of tax incentives for training in road safety Resources network for motivation in formal and non-formal education Training journalists to educate while informing about accidents Permanent and focalized dissemination campaigns		
Sources: CONASET (1995), CONASET 2004 and Urzúa (2006).		

6 WHY DID THE POLICY SUCCEED? AN INTERPRETATION

Our focus has been upon *the way a road safety policy should be initiated* in a developing country having no comprehensive policy in this field. We have argued against the common-sense approach that deals with road safety through *simplification*, by focusing on a small number of high-impact measures, and have argued for *dealing with the whole complexity of the situation*. It is time to provide an interpretation of the reasons why this approach did yield such significant results.

In order to fully understand what actually happened in Chile, we invite the reader to follow our approach in its own terms, which may be unusual since it is based on “social systems thinking” rather than on “analytical thinking”. Analyzing means taking things apart: it is the basis of engineering and economics, and of today’s common sense, and is the source of the question about the highest-impact measures. Our social-systems question, however, was quite different: *How to build up an effective and sustainable action system for road safety as a whole, which may generate a permanent stream of diverse and effective measures?*

In consequence, we deal now with the whole road-safety system rather than with individual measures. It is not even possible to separate individual impacts, since the number of projects was very large (i.e., 76) and strong and permanent interactions took place among them and among the actors in charge. It was the joint effect of these interacting projects which brought about the overall impact of the policy, rather than the effect of a few specific projects.

In our interpretation, the policy succeeded because it applied a set of principles that make it possible to *match* the real-world complexity –instead of ignoring, missing or simplifying it–, by building up an equally-complex capability for effective action. Such principles are:

1. Understand road safety as a social system – not a mechanical one: The physical interactions vehicle–person–road that lead to road accidents take place in the context of broader interactions in the political, social, economic and cultural spheres of society. The action capability to be built should be able to impact upon such broader spheres and must be understood as a system of social actors rather than a mechanical system.¹
2. Declare the political intention to build a wide action system: This is a key act of leadership in road safety policy making. In Chile this was accomplished by coining the name “National System for Transit Safety” and by stating that the central policy objective was to build such a system. This idea proved highly motivating and provided a concrete and practical focus for generating political will and for mobilizing action capabilities from many areas of Chilean society.
3. Mobilize a large and diverse number of people around this future-building task: This is the most effective way to make sure that the whole complexity of a concrete road-safety situation will be considered and no aspect of it will be missed. The people’s stock of knowledge, experience and valuable insights is huge. Moreover, people are normally willing to contribute, provided they will be respected and acknowledged, and not exploited.
4. Apply an enabling leadership style – not a domineering one: A truly effective leader in the complex world is the enabler of people to contribute proposals and actions, not the controller of people. By facilitating the rise of new actors, such a leader will have wide coverage of the field and faithful allies. A usual excuse for the domineering style, i.e., the supposed ineffectiveness of participation, is based on a confusion of participation with assembly-like activities.
5. Let the real-world actors create – not just the technicians: All interested ones should be allowed to make proposals and contribute to implementation. Experts usually know more about means, but real-world actors –managers, drivers, judges, road designers, police officers– know better the ends to be pursued and know the practical details.
6. Use specialized tools to externalize people’s knowledge: Non-expert knowledge, though huge, is rarely tapped because it is not formalized and readily-available, or *explicit*. In knowledge-management terms it is *tacit*, and needs to be externalized. This difficulty is solved through the special methods and tools of Participatory Innovation being mentioned presently. In systems terms, they are high-variety methods and tools.
7. Generate via participation a clear blueprint for the system to be built: The blueprint provided by the *action map* presented on section 5.4 made it clear what the National System for Traffic Safety would involve, and facilitated the key act of leadership of the process. This map provided the conceptual structure for both understanding the system and managing the implementation of the policy over a 10-year period.

¹ A question for further inquiry deals with the Haddon approach, a mechanical model that is certainly valid for designing individual road safety measures. Its validity for overall policy making in developing countries, however, as recommended by the World Report on road safety (WHO, 2005, p. 5) does not follow from this fact.

8. Implement a large number of inter-related and realistic projects: The high complexity of road safety, –which is a multi-dimensional challenge– can only be matched with a large number of projects that cover all dimensions. No “star” project can match such complexity by itself. Projects are identified via participation to secure their realism, are designed in mutual interaction to secure their overall impact, and are normally implemented as joint-ventures with participating actors.
9. Set up a multi-actor management system: An integrated management system for the whole process is essential, but should not be built until the blueprint of the system and the first significant group of projects are well defined. Otherwise it may become just another instance of lust for power. It should have a management team with systemic vision and social and technical strengths, deal with both strategy and operations, and evaluate and re-design periodically the road safety system through participation.

The application of these principles led to a well-established policy system in Chile for road safety, with leadership at CONASET, which has shown: (a) the commitment from most relevant actors, (b) its capacity to mobilize support from public, private and academic actors, (c) a common language for all actors, and (d) the capacity to survive a five-year period of complete lack of political interest in it, and a budget that never rose above the US\$ 2 million level for a country of 16 million people.

REFERENCES

- Ashby, W. Ross (1956), *Variety, constraint and the law of requisite variety* (From W.R. Ashby, An introduction to cybernetics, London: Chapman and Hall, Chapter 7, pp. 123-124 and Chapter 11, pp. 202-209). Reprinted in W. Buckley (ed.), *Modern systems research for the behavioral scientist. A sourcebook*. Chicago: Aldine Publishing Company, 1968. Second printing 1969, pp. 129-136.
- CONASET (1995), *Potentialities for the improvement of road safety in Chile*. Executive Secretariat, National Road Safety Commission, Santiago, May, 88 p. [In Spanish.]
- CONASET (2004), *Potentialities for the improvement of road safety: An evaluation 10 years after their formulation*. Executive Secretariat, National Road Safety Commission, 44 p. [In Spanish.]
- Del Valle, Alfredo (1992), *Innovative planning for development: An action-oriented approach*. A dissertation in social systems sciences submitted to the University of Pennsylvania. Ann Arbor: University Microfilms International, xi + 291 p.
- Del Valle, Alfredo (1999), Managing complexity through methodical participation: The case of air quality in Santiago de Chile, *Systemic Practice and Action Research*, Vol. 12, N° 4 pp. 367-380.
- Del Valle, Alfredo (2002), Development: Innovation with participation. Towards a systemic theory and practice of development. *Revista Chilena de Administración Pública*, August, pp. 29-56. [In Spanish.]
- Inter-Ministerial Commission for Road Safety (1994), *National Road Safety Policy*, 66 p. [In Spanish.]
- Urzúa, Julio (2006), *National Road Safety Commission: Achievements and challenges*. Presentation by CONASET’s Executive Secretary at the Latin American and Caribbean Planning Meeting on Road Safety, 16 slides, Santiago, 18-19 January. [In Spanish.]
- World Health Organization WHO (2004), *World report on road traffic injury prevention: summary*. Geneva, xiv+52 p.