TOWARD A NEW FEDERAL POLICE FORCE IN MEXICO: AN ANALYSIS OF CRITICAL PROCESSES THROUGH SYSTEM DYNAMICS

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ABSTRACT

The insecurity crisis that Mexico is facing has taken to a reform in the Federal Law to impel the development of a new federal police, with trained elements in knowledge and tactics that allow them to face the crime of one more effective and coordinated way. The present work shows the results of a project designed to evaluate how feasible would be the implementation of such law. It required integrating a team with officers of the Federal Police force to design a dynamic model to analyze the key processes related to the transition of the current force to a new structure required for the law. This document presents the methodological frame, the design of the model some findings about the process and a scenario analysis to visualize some strategies that could be implemented in order fulfill the requirements of the law.

KEYWORDS: Dynamic model, police development, scenario analysis.

INTRODUCTION

We have seen in Mexico how violence and insecurity have become increasingly visible. Citizens perceive that the authorities have been overrun by crime, particularly those who are responsible of monitoring it and enforcing it. There is an inability in the police force, in the three levels of government (federal, state and municipal), to reduce the increase in crime rates resulting from the narcotics industry and its diversification towards other criminal branches such as kidnapping.

The citizens expressed their rejection to the state of insecurity in which they live. However, it would be naïve to think that the increase in violence and insecurity are caused by circumstances arising from short term. As Javier Livas points out: "We are paying the consequences of not having paid attention to the deficiencies of a slow, inefficient and easily corrupted system of administration of justice. People know that the justice system is totally useless. " (Livas, 2008).

The government recognizes the citizen complaint, as expressed in the General Law of the National System of Public Security (GLNSPS) announced in the Official Journal/Newspaper of the Federation (Pública, 2008) : "Citizenship has emphasized in multiple issues which include: "lack of ethics, programs, methods of prevention, investigation techniques, effective and exemplary sanctions for public servers who have to ensure public safety in Mexico but take advantage of their position to practice delinquency; coupled with this, an ailment of society is a coordination

between the levels of government to solve a problem that is common to all, beyond the protocol, translates into a healthy understanding among the federal, states and municipalities. "

The GLNSPS proposed to reform the public security system and attack the problems in a very structural way through an integral system that contemplates the prevention, investigation and prosecution of the antisocial behavior. This law proposes a master Program of Professionalization, that should be apply to all public security institutions. Besides of this, the law is focus intend a deep change of the Federal Police through some key process: the Leveling process, which aim is to assure that every policeman fulfill the requirements of every level such as academic credentials and age. The process of Professionalization is related to the training require in each level of the police scale. And the last process is related with Depuration. The law is requiring than every police active in force take some exams to evaluate if that person is confident and has no bounds with the criminal organizations and the main examination of this process has to be with the use of polygraph.

The questions at this point in term of the requirements of the process mentioned before are: Is it feasible to operate the law in the terms in which it is written? What aspects should be taken into account to increase the probabilities of a successful transition from the current state of force required by the GLNSPS?

To respond that question, it is required the use of methodologies and tools that give support to decision makers of the SSP (Public Security Agency), and agencies involved, in the management of the complexity in a system of such dimensions. System Dynamics, among the tools and methodologies that can be used to cope with complexity in a constantly changing system, is the methodology to use in this investigation.

The *objective* is to analyze the critical processes that must be taken into account in relation to Leveling, Professionalization and Purification process in the transition to the new structure required by the new General Law of the National System of Public Security.

The methodological framework considers a systemic approach to the structure of the situation to be modeled; a System Dynamic Model will be design to analyze the relationship between structure-behavior and a scenarios design to visualize possible strategies that lead to compliance with the guidelines of the new structure.

The *scope* of this investigation is limited to the following *specific objectives* that were determined from the critical factors to analyze in transition to the new Integral System of Police Development (ISPD):
1. What are the training requirements in terms of hours and instructors?
2. What is the time required to certify that troops meet the requirements of the ISPD?
3. Can a dynamic of promotions in the ranks be given under the new structure?
4. How much of the police population evaluated is expected to be fired due to failure in the assessments?
5. How many candidates should to be accepting in each call for the first level of the scale?
6. What strategies can be implemented to standardize the existing structure as required by the new structure of the ISPD?

2. METODOLOGICAL FRAMEWORK

The complexity, as a concept, has been addressed by different authors. Sterman (2000) states that it is not based on the number of variables of the phenomenon to study, but to the degree of interaction between them and the perception that the decision maker has about the phenomenon. This means that an individual may perceive a problem in the present, but because of the complexity this responsibility might attribute to nearby/local causes in time and space, proposing a solution in this regard. This could pose a counterintuitive reaction in the system, which means, the system will react in opposite ways to what the decision makes would expect when applying the solution, because the original causes are not the product of short term (Forrester, 1971). Other characteristics that the complex systems have are the following (SSP, 2008): they are highly coupled situations, they are phenomenon on continuous move, and they behave atypically and resist aligning to generalizing, obvious, and simplistic policies and their cause-effect behavior changes with time.

Forrester (1971) states that many of the problems currently being manifested are the product of decisions taken two or three decades ago. Then tools and methodologies are required that could be used to deal with the complexity in a rapidly changing environment**.** How do you represent more abstract systems, such as Social Systems? Forrester points in that direction: "Social systems are much more complex and difficult to understand than the technological

systems. So why not use the same approach to produce models of social systems and conduct laboratory experiments before putting new laws and government programs? The response of rigor means that our understanding of social systems is not enough to build useful models. " (Forrester, 1971)

In this paper, we shall use the System Dynamics Modeling to conceptualize a complex social system that will be affected by a new law: the federal SSP under the new General Law of the National System of Public Security.

The principle underpinning the Integral System of Police Development (ISPD is represented by the reform of the Constitutional Article 21 (SSP, 2008), which establishes the changes to the police activities, with new guidelines pertaining to the policing model, in which corporations of the three branches of government operate and currently presents serious factors of decoupling between the prevention, reaction and investigation. This helps to build and maintain important spaces that encourage crime and the proliferation of criminal groups, as mapped in the causal diagram in **Figure 1**.
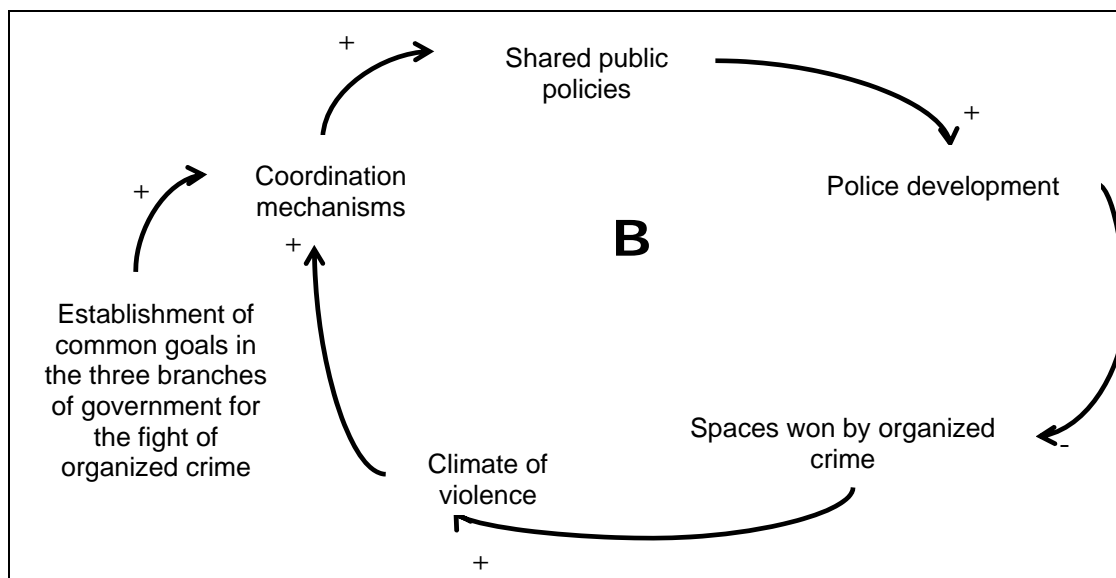

Figure 1. Dynamics of Crime

The diagram shows how by reducing the coordination mechanisms in the three branches of government, the shared public policies are also reduced, which leads to an increase of inequality in the police development and allows organized crime to be gain space. This also leads to an increase in climate of violence, which demands a greater number of coordination mechanisms.

But this can be reversed, given the nature of the loop: the loop's negative polarity indicates that this is a balance, which intends to steer the system to a target value. This means that the state of the system will improve when implementing corrective actions that will enable it, in each time of the reaction of the loop, to close the gap between the current and desired conditions, as implementing such corrective actions the dynamics that could be generated is the following:

By increasing the coordination mechanisms at the three branches of government the shared public policies would increase, this will lead to an equitable development in the police force that will enable to be in conditions and pursue measures that would facilitate that organized crime stops winning spaces and this climate of violence would diminishing. The Integrated System of Police Development is part of this group of corrective actions.

It is in this spirit, that the reform of Article 21, adopted at the General Law of the National System of Public Security, redefines the scope of the role of the police, so the coordination mechanisms are given. It also expresses, that for achieving the objectives of Public Safety, the minimum bases should be covered, one of which includes the

regulation of recruitment, admission, training, retention, evaluation, recognition and certification of members of the security institutions of the three branches of government. It also states that no person should be admitted to the public security institutions if they are neither properly certified nor registered in the system.

Given the above, it requires organizational and structural changes aimed at improving the preparation, action and coordination between different security actors, including the definition of procedures, responsibilities, profiles and objectives under the ISDP. This includes issues related to the horizontal mobility and promotions, as well as those factors that together should keep staff motivated, among others.

On the other hand, it also requires ensuring that only candidates who demonstrate their professional skills and integrity and whose actions strictly follow within the framework of legality (SSP, 2008) are admitted to the police. For this purpose, it will require the application of assessments to ensure the profile of those entering the police, and to identify those with dedication to the service, preparation and ethical values. Figure 8 shows the system elements that must interact to achieve the objective of law enforcement coordination and the development in the three branches of government.

4. CONCEPTUALIZATION: FEEDBACK LOOPS.

This stage covers the structural design of the model under the dynamics hypothesis: how the system will behave given the variables that must be included and the relationship between them? Figure 2 shows the Causal Loop diagram.

Description of each loop
Loop B1, B5 (disclaimers): the more effective bearing a certain range has; there will be more resignations in that range. Both quantities will be related by a rate of specific resignation to the time that is obligatory to stage within that range. The more resignations a range has, the lower the number of troops in it.

Loop B2 (no change of status from a no-candidate to a candidate): the rate of recruitment will increase the number of staff who holds one of the ranges. The greater the numbers of troops, who are not candidates for promotion, there will be more capacity to increase the number of candidates to ascend to the next rank. While there are more candidates for promotion, the number of troops who are not candidates will decrease. This status will change according to the dwell time required to apply for the range.

Loop B3 (promotion to the next rank): the number of promotions in particular is subject to the existence of available places, which reduces every time you increase the number of elements in the next rank and increases as the limit of staff that you can have in a rank is higher. In turn, the more available places there are, means that there are fewer elements in that range. The existence of available places determines a real-time promotion, which at best is equal to the amount of time for revisions and the time between calls. Finally, there is a new success rate in the reviews that determines what percentage of candidates will be able to hold the new rank.

B4 Loop (Fired people): the more effective candidates to ascend to the next range are, the more people will be fired in that group. Both quantities are related by a special low rate.

Loop B7 (co-flow): the higher the rate of study whiles within a range is, the higher the average education of the elements bearing the same will be (assuming an increase in schooling while in the police force). The people fired of all types, as well as promotions, lower the average schooling level of the range, since they involve the recruitment of less educated elements to it. Arrows are not included among the people fired for not doing the revision and the resignation of non-candidate and the average schooling, as with other types of discharged and surrenders, for reasons of clarity in the diagram. In the ranges that have the minimum schooling required, it must be met in order to advance. R1 loop indicates that the dynamic between the elements is reinforced; the school will define how the troops are fit for promotion to the next rank.
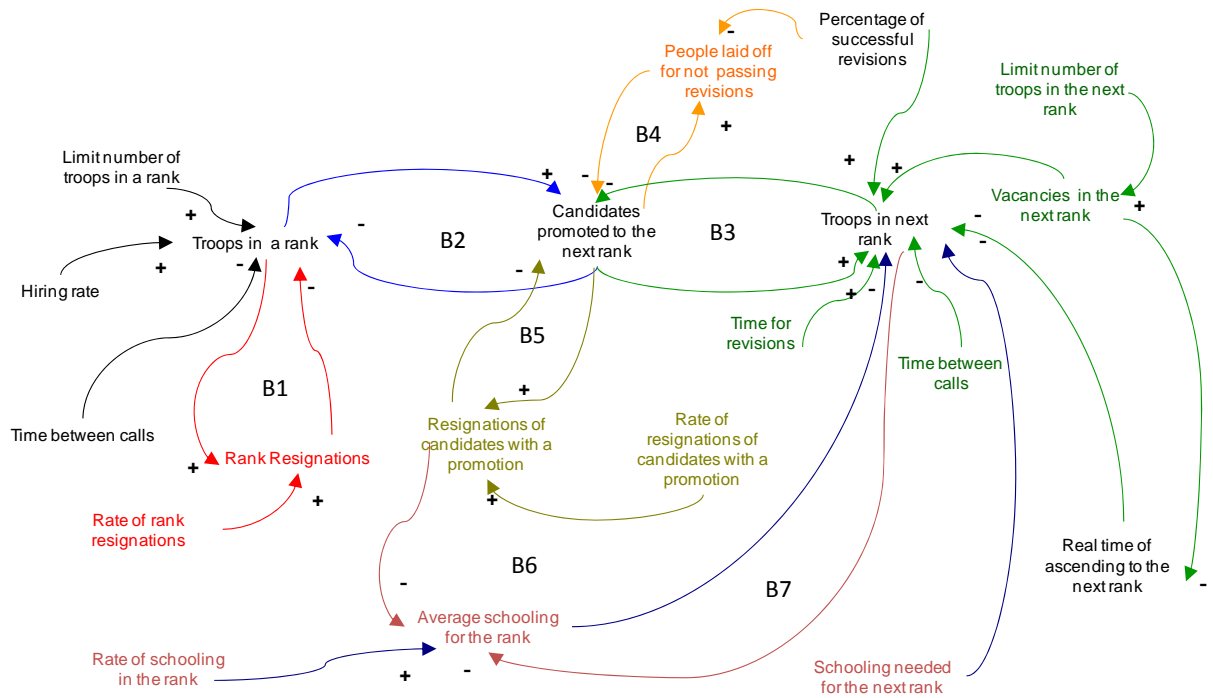
Figure 2. *Causal Loop Diagram*

DESIGN OF THE SIMULATION MODEL

Clearly, the ISDP is an integral system with multiple dimensions that requires design procedures, which when operating, achieve the objectives set for it. Under that premise, the actors in the design and implementation of ISDP considered that the design of a dynamic model could be useful to represent the transition of the current Federal Force staff to the ISDP. It was established that for practical purposes it would take all of the current strength in the ranges that would apply in the new scale, to assess adherence to the requirements of each level as well as the dynamics associated with the Professionalization and Depuration processes. For practical purposes, the analysis will consider the area on the Prevention considering only the transition model of the three hierarchies given that 99% of staff belongs to this.

It was established as 15 years simulation horizon because the decision makers at that time felt that in that time, it could be observed the full dynamics of the Basic Scale. Important information was gathered from documents provided by the General Coordination of the Police Training Institute and the General Department of Coordination and Development of State and Municipal Police, the General Law Project of the National System of Public Security, and the National Center of Trust Control, among others. In the simulation model was represented each scale level, from basic to higher command.

Appendix 1 provides a sub-model that considers the dynamics between the Police and Police Third ranges. The whole model is integrated by 13 sectors, using a co-flow to manage the amount of scholar training since elementary school to postgraduate programs.

To present the results, firstly analyzes the evolution of the current police force considering the patterns of people laid off and expected promotions, according to the model parameters. This part is essential to understand the impact of policy advocacy and the evaluation results of the Center of Trust Control.

DISCUSSION OF RESULTS OF THE BASIC SCALE

The cumulative total number of people fired, by not passing on the basic scale revisions at the end of 15 years, is approximately 6,460, as shown in Figure 1.
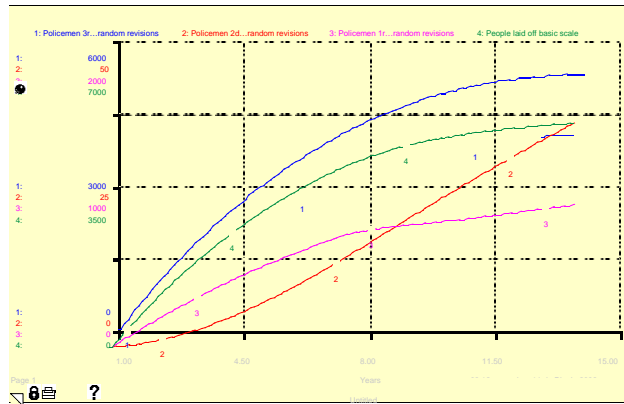
Graph 1. *People laid off in the Basic Scale*

In relation to the time in which the strength of the basic scale could be fully certified, the simulation showed that it will takes two years to become certified. The data is obtained by calculating the cumulative column qualified elements, for example, adds to the Third Police 6,484 and 5,636 and gives us a total of 12,120. This means that approximately in one and a half year the Third Police degree would be ready.

In conclusion, for the certification process it is required, on average, two years to fulfill the academic requirements, to professionalize and depurate of the police force in the basic scale, according to the model results based on the information gathered and the assumptions made based on it.

SCENARIO ANALISYS

The different techniques for the design of scenarios have a common starting point: the clarification of the system in terms of its component elements, their relationships and the exogenous variables that might be altering their future conduct. Godet (2000) calls the first stage of the Strategic Planning scenarios methodology "The problem exposed, the system to study" in which makes use of tools such as Foresight Workshop, Structural Analysis and the Tree of competencies to clarify the study objective and from there into the design of scenarios. For this study, we used the approximation of Systemic thinking to approach the situation to study, and the System Dynamics Modeling to map the structural behavior of the variables over time.

The analysis of the previous chapter has shown the discrepancy between the current structure and the requirements that demands the new structure. The current dynamic of the system prevents the promotion of troops to the next level ranks so that corrective actions are required in order to fulfill the structure´s requirements on the premise that the troops will be in the range where they belong.

It requires, therefore, policy decisions to maximize adherence to the structure required and to generate the desired mobility.
To explore possible alternatives to carry the current strength of the Federal Force to the state requested by the ISDP it will use dynamic scenarios. They take this name because the assumptions on which you want to investigate its impact will be tested in the simulation model already designed and will return results of future behavior given the assumptions taken as the basis for each scenario.

For this purpose four scenarios are designed to the interaction of two axes:
Horizontal: degree of attachment to the structure required. This axis refers to how much the state keeps the proportions of agreement to the state of total strength.

Vertical: degree of mobility in the force. It relates to the number of calls that will open by year and the frequency, as well as the transit of troops, between different levels of government.

The quadrants that result from the combination of the two axes are named after the possible strategy that could lead to the realization of each of them. One can see that the name of each one is descriptive in this sense as shown in Figure 3.
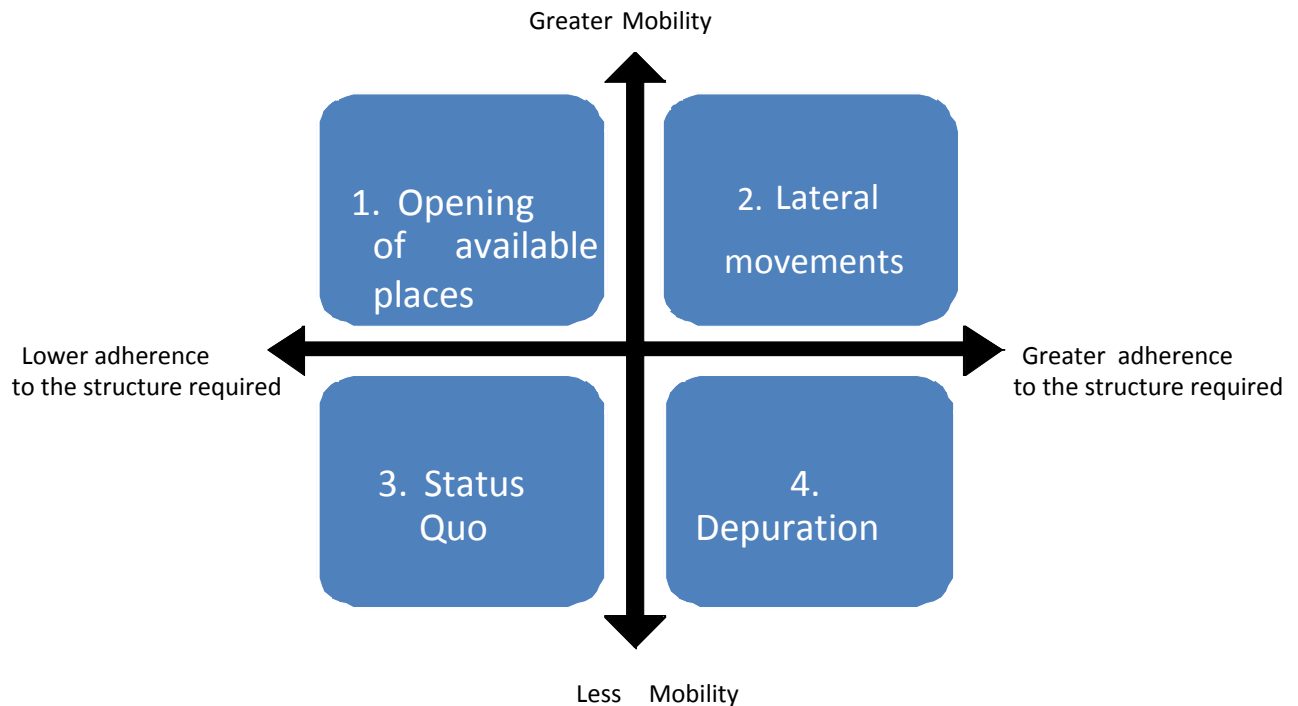

Figure 3. *Scenarios*

We conclude after reviewing the characteristics of each scenario that the police force will grow to reach the mobility require to have promotions on each level of the basic scale but having less adherence to the requirements of the new structure. The Scenario 2 could be realized if the force decides to allow promotion in a structure that is shaped like an inverted pyramid looking for a mobility of the force transfers to state and municipal police. In other words, the strategy is to move some effectives to other forces since all policemen has the same credentials after de ISDP. Scenario 3 reflects the tendency of the current situation, and no changes are only written down the items that do not pass certification. Scenario four is the most dangerous, since it might lead to a counterintuitive effect on the system: to fired the effectives that do not meet the requirements of ISDP, to show the public that are taking action, to clean the corporations unsuitable elements, but in a time horizon not so long ago the crime may increase due to trained personnel being launched to a criminal labor market that will pay handsomely for their services.

CONCLUSIONS

Undoubtedly, the ISPD is a complex system: the different parts must interact to achieve the goal, there are delays inherent in the system, how the waiting times for promotion and capacity to conduct assessments, as showed in the behavior of the model; there is an urgency that could lead decision makers to make short-term solutions such as laxity in law enforcement, or other extreme peak demand, leading to a cessation of effective mass as revised Scenarios analysis.

It must be mentioned that ultimately the model is designed to simplify the real system. In this sense, Morecroft (2007) notes that one of the biggest challenges in any kind of modeling is to decide, among a huge number of variables, which leave out and which to include. This research was no exception. The model has limitations as to the

items included and the mathematical definition of variables, as well as some data was estimated because the actual information was not available at the times required. Even with the limitations above, answers were found that were very useful for decision makers. The following is a summary of key findings organized according to the specific objectives defined for this project.

What are the training requirements in terms of hours and instructors?

By the first year, would be required, based on the assumption about hours of training, nearly four million hours to a number of troops round in 13,600. The number of hours could be covered with 1,630 full-time instructors. This data shows that the fact of having to spend hours of service to the training results in an effective force representing 85% of the total force. This data is useful for planning skills and to be aware that more troops are required to complete 100%. In summary, the first four years are the most intensive since it involves training the force to meet certification.

What is the time required to certify that troops meet the requirements of the ISPD*?*

For the certification process, it is required on average two years to level of force. Special care must be put in the ranges where higher education is required, for example First Police. In the definition of the current situation, it is shown that only 67% meet the requirement, so special attention needs to be paid to finding ways of leveling.

It is possible to have promotions in the ranks under the new structure?

It highlights the most critical aspects observed in the basic scale ranges: Third Police: with the increased capabilities of the next rank by 10% those troops would be rising in about 12 years. Second Police: the funnel effect is most evident in the mobility of rank from Second Police to First Police, mobility is lower in that the available spaces are scarce and the system in the later ranks must move to open spaces. The reason why the Second Police will take about ten years to begin to flow can be understood due to the surplus so large relative to the tertiary structure. The 10% growth in the capacity of that range is hardly enough to generate mobility: of 1773 Second ascent candidates in year 1, can only climb 193 which available places are generated in the next rank. First Police: the promotions to Sergeant First Police are most committed is the range with most disparity presents with the tertiary structure. Because they are the highest ranks of the scale, it would be expected that a transfer is made between corporations of the other two branches of government: state and municipal.

What amount of the police population evaluated is expected to be fired due to the failure of the assessments?

The cumulative total number of people fired by not passing the basic scale revisions at the end of 15 years is approximately 6,460. Of this number, the one that contributes the most, given its proportion with around 5.370 troops is the Third Police. The data is very important because it can be taken to a cost study to represent the number of items laid off, in addition to considerations associated with the possibility that such items enter to criminal organizations. This requires a separate treatment and could demand a strategic intelligence system designed for monitoring of the force that has been fired.

How many items should be accepted in each call for Raso Police (the basic level of the force)?

Let´s recall that the initial population for this range in the current structure is of 3 effectives against 19,683 which require the tertiary scale. Obviously you cannot make a call to close the gap immediately; this would resolve in short term the need for troops but would create a problem in the long run because they would have no long-term career opportunities. After taking the product comparative analysis of the sensitivity analysis it was concluded that gradual approach to the tertiary structure should be seek, considering an income between 5,000 and 6,000 troops annually. Obviously one must first solve the surplus of troops in the ranks, and having decided the size of force for each of the ranges, to define the number of available places that will open to Raso Police.

What strategies could be implemented to standardize the existing structure as required by the new structure of the ISDP?

The Scenario Analysis from assumptions taken from the real system: considering the elements above, scenarios were explored to visualize some impacts associated with the implementation of the General Law of the National System of Public Security, which were not meant to be exhaustive, rather illustrative of the implications of some aspects that were considered critical. It was concluded that, before growing the force, the mechanisms of coordination that the ISDP provided for the effective transfer to state and municipal police forces must be used. It was also made an important observation about the inherent risk about that police officers fired were hired by the criminal groups.

The benefit of the abstraction of a complex real system was given when monitoring, of the five hundred variables of the model, only few variables related to the aim of the study. The decision makers of the Federal Police considered that it was very useful to have the model for which an interface was designed to facilitate its use, showed in Figure 20. A workshop was offered to explain the model and the use of such interface. Appendix 2 presents the window where the interface of the simulation model is displayed.

In relation to System Dynamics Modeling and the Public Policy there is a broad way to go. The effort of the Club of Rome in the 70's to bring the world leaders and the general public to a reflection on the limits to growth through the construction of a simulation model was the first major example of how dynamic models could help in this aspect (Meadow, 1973). Subsequent contributions have been made to study population dynamics and problems of urban transport, regional development and environmental systems (Roberts, 1978). In the Latin American context are particularly noteworthy of a special mention the works of the Colombian community of System Dynamics related to the war on drugs, prison systems and the energy market (Sotaquirá, Lopez, Espinosa, Dyner, & Andrade, 2001).

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Apendix 1. Submodel of Raso Police.

The whole model considers 13 sectors, one for each scale in the force.
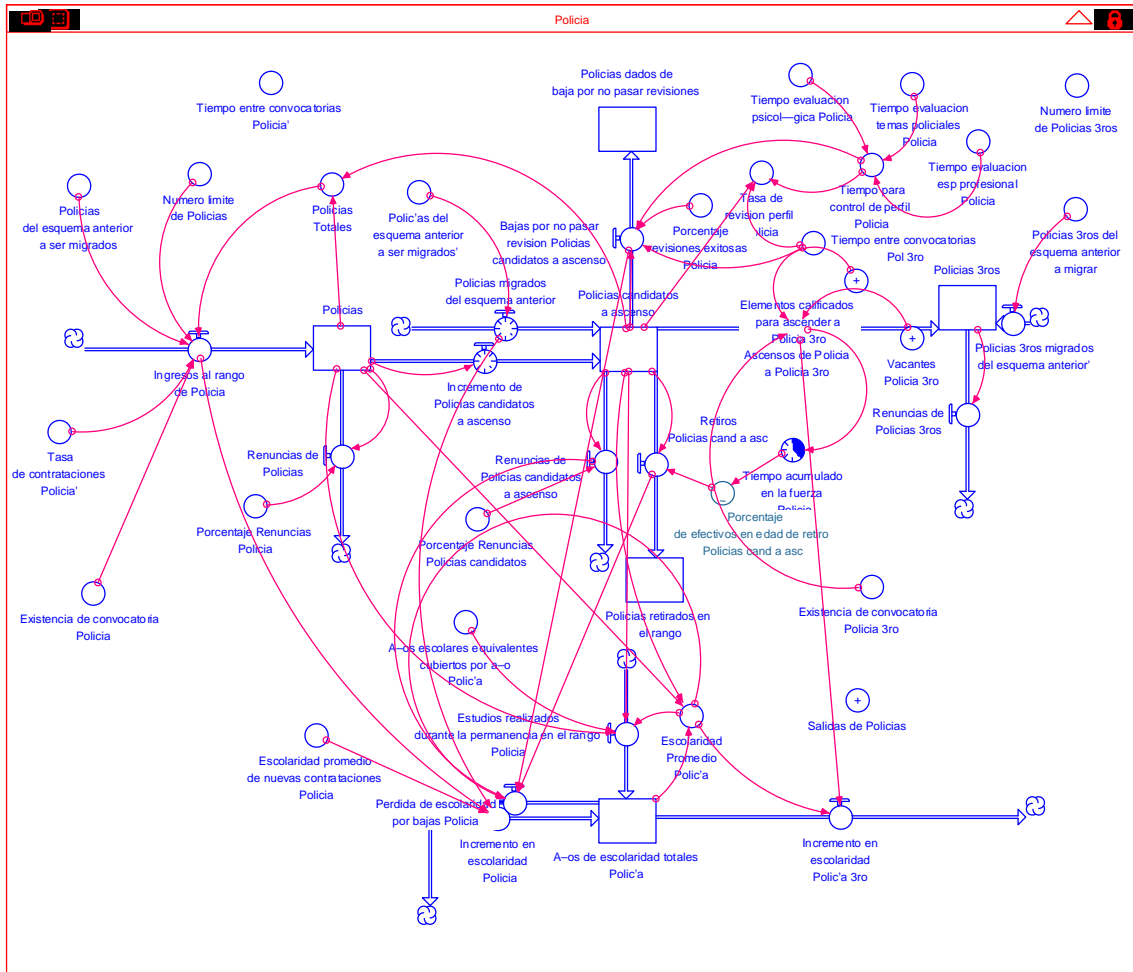
Variables Appendix 1

Since we have the model written in spanish, we present below a table with the translation of the variables. Apologize for not presenting the modelo in english, we are wonking on that.

Spanish	English Translation
Tiempo entre convocatorias	Time between calls
Número límite de policías	Limit number of policemen
Policías del esquema anterior a ser migrados	Police the previous scheme to be migrated
Ingresos al rango de Policía	People hired to the police rank
Tasa de contrataciones	Rate of people hired

Existencia de convocatoria	Existence of call
Renuncias de Policías	Resignations of policemen
Porcentaje Renuncias de Policía	Percentage of resignations of policemen
Policías Totales	Total policemen
Policías	Policemen
Policías migrados del esquema anterior	Police migrated from the previous scheme
Incremento de Policías candidatos a ascenso	Increase of policemen to be promoted
Porcentaje Renuncias Policías candidatos	Percentage of resignations of policemen with promotions
Escolaridad promedio de nuevas contrataciones	Average schooling for people hired
Años escolares equivalentes cubiertos por años policías	Years of schooling covered for years as policemen
Estudios realizados durante la permanencia en el rango	Schooling while in the Rank
Perdida de escolaridad por bajas	Lost of schooling because of people laid off
Incremento en escolaridad	Increase of schooling (academic training since basic education to postgraduate studies)
Años de escolaridad totales	Total years of schooling
Escolaridad Promedio	Average schooling
Policías retirados en el rango	Policemen retired in the Rank
Policías candidatos a ascenso	Policemen that are candidates to be promoted
Bajas por no pasar revisión para policías candidatos a ascenso	People laid off for not passing revisions
Policías dados de baja por no pasar revisiones	Policemen laid off for not passing revisions
Tiempo de evaluación psicológica	Time for Psychological evaluation
Porcentaje de revisiones exitosas	Percentage of successful revisions
Tasa de revisión de perfil	Rate of profile revisions
Tiempo evaluación de temas policiales	Time to evaluate police issues
Tiempo para control de perfil	Time for perfil control
Tiempo de evaluación profesional	Time for professional evaluations

Tiempo entre convocatorias	Time between calls
Policías terceros	Third Police
Tiempo acumulado en la fuerza	Time accumulated in the force
Elementos candidatos para ascender	Candidates for promotion
Existencia de convocatoria Policía tercero	Existence of calls for Third Police
Número limite de Policías terceros	Limit number of Third Police
Policías terceros del esquema anterior a migrar	Third police from the previous scheme to migrate
Policías terceros migrados del esquema anterior	Police migrated from the previous scheme
Renuncias de policías terceros	Resignations of Third Police
Vacantes de policías terceros	Available places of Third Police
Incremento en escolaridad para Policía tercero	Increase of schooling for Third Police

Appendix 2.

Appendix 2 variables

Spanish	English Translation
Alternativas para la implementación del Nuevo modelo policial	Alternatives for the implementation of the new police model
Descripción de modelo	Model Description
Instrucciones	Instructions
Mapa Conceptual	Conceptual Map
Correr Modelo	Run Model