

Monterrey, International Knowledge City (MIKC)
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4. MIKC: EVOLUTION TOWARD PHASE 2

Those cities or regions, which for their knowledge-based development have been supported by a strategic plan or master plan, have advanced in a fast, integral, effective and sustained way regarding their economic and social development. In Nuevo Leon, the actors and participants in the Triple Helix conceptual model have also recognized the importance of depending on a strategic master plan which included medium and long term initiatives within the main **Knowledge City or Region Pillars**: Human Capital Education and Development; Science and Technology, Knowledge and Intellectual Capital; Innovation and Entrepreneurship Culture; Infrastructure and Urban Equipment and Strong Institutions that will foster them in conjunction with the active participation from different sectors of society (public, academic, productive) and the civil society in an appropriate legal and institutional framework.

Nuevo Leon's State Governor, Mr. Jose Natividad Gonzalez Paras (2003-2009), pointed out that, **"...a knowledge city is a geographical area where, according to a plan and to a general strategy, assumed by both the Government and the society, the actors have the common goal of building an economy based on knowledge development..."**¹.

Therefore, the transition towards the MIKC Phase 2 program is to be fostered through the design of an integral master plan which, on the one hand, reinforces the advances achieved during Phase 1 and, on the other, allows the implementation of new proposals consisting of strategies, public policies, programs, projects, actions, infrastructure projects, institutional reinforcement, and recommendations regarding economic, budget or investment resources, and the convenient continuity for the next phases in the MIKC program. Additionally, by means of a guiding road map toward 2005, visualize the progress for the economy and knowledge society against a system of indicators, at suggested periods for initiation, growth and consolidation, as well as the advancement of each proposal which has been especially elaborated to boost the impact and results of the MIKC Program in the short term (2009-2010), the medium term (2011-2015), and the long term (2016-2025), with the possibility of initiating, in some case, during the second half of 2008.

The following segments include:

- In an executive display, the **proposals designed by the working team from Tecnológico de Monterrey for the strengthening of the MIKC Program Phase 2**, which have included many of the recommendations from Nuevo Leon government officials; members from the State Legislature; deans from main local Universities; leaders from the business sector and international experts. For more detailed information, se Appendix I: MIKC Advances and Challenges, the opinion from some

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leaders in Nuevo León; and Appendix II: Details on MIKC proposals and master plan for Phase 2: public policies, programs, projects, institutions and resource investment.

- **Road Map toward 2025**, a guideline and reference guide for goals recommended in the indicators system and for the different proposals developed for MIKC Phase 2. For more detailed information, see Appendix III: Road Map – 2009-2025 Plan.
- **Success measurement system**, which enables evaluation, follow-up and feedback for the MIKC Program by means of a system of indicators, with suggestions at different stages for the 2008-2025 period. For more information, see Appendix IV: Measurement, indicators and follow up systems.

4.1 Proposals for the strengthening: strategies, public policies, programs, projects, alliances and budgets.

For the design of the **proposals described in the MIKC Program Master Plan for Phase 2**, it was considered highly strategic to link these to: **the advances achieved in Phase 1; the National Development Plan (PND 2007-2012); the support programs from dependencies and organizations of the federal government and from some important international organizations; the State Development Plan (PED 2004-2009); the support programs from dependencies and organizations of the state government and all research documents, diagnoses and programs implemented in regards to the MIKC Program Phase 1 and Phase 2.**

The results and components obtained from the following activities were also considered:

- **Diagnosis of the State of NUEVO LEON at the national level** regarding its status as a **knowledge economy** and a diagnosis of the city of Monterrey as a **knowledge city** at the international, regional and local levels, based on research performed by experts from the Tecnológico de Monterrey. For more information, see Appendix VI: Nuevo Leon in the national context and Monterrey in the international context.
- **Performance and results analysis for 38 interviews carried out with key actors and leaders for the launch of the MIKC Program.** For more information, see Appendix VIII: Methodology for research performed.
- **Elaboration of 8 videos and virtual conferences with international experts in knowledge cities.** For more information, see Appendix VIII: Methodology for research performed.

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- **Analysis and collection of the best practices that have been implemented by 6 successful knowledge cities** internationally recognized and previously selected based on an analysis carried out by the working team from the Tecnológico de Monterrey, and under the consensus and previous analysis by public officials from the I²T² of the government of Nuevo Leon and the IDB. For more information, see Appendix V: Successful experiences in other international knowledge cities.
- **Complementary analysis of a survey among 309 local and foreign ITESM alumnae/i**, conducted by Tecnológico de Monterrey for statistical purposes, which shows the opinions of former graduates regarding several topics on Nuevo Leon and Monterrey, some of which were considered a useful input for MIKC Phase 2.

Based on all the input data, documentation and analyses, together with **the contributions from the Tecnológico de Monterrey working team**, we have defined the major tasks on which we consider that the MIKC Program should focus their public, private and institutional efforts in order to accelerate and increase its potential and results in the context of knowledge region, economy and society, during Phase 2.

Below is an **executive summary with the proposals elaborated for each of the 5 pillars we consider most important and which support knowledge cities**. The detailed proposals are found in Appendix II: Details on MIKC proposals and master plan for Phase 2: public policies, programs, projects, institutions and resource investment.

4.1.1 Human Capital Education and Development

The **education and the development of human capital, from the elementary level to the undergraduate and graduate levels**, pertain without a doubt to the **greater impact areas in the development toward a knowledge society**.

Thanks to human capital education and development, **with a wide coverage, quality and appropriateness, above all focusing on strategic areas selected for a specific region to be developed**, we can achieve the availability of highly trained and specialized human resources within the sectors of greater demand, growth, or development opportunities, which represents a high impact in the increase of employment indexes and their quality. It also offers better opportunities for the development of innovations, entrepreneurship, and that of independent professionals.

MIKC, with its focus on five strategic technological areas: Biotechnology, Mechatronics, Information and Communication Technologies, Health Sciences and Nanotechnology requires, ever more, highly educated, prepared and

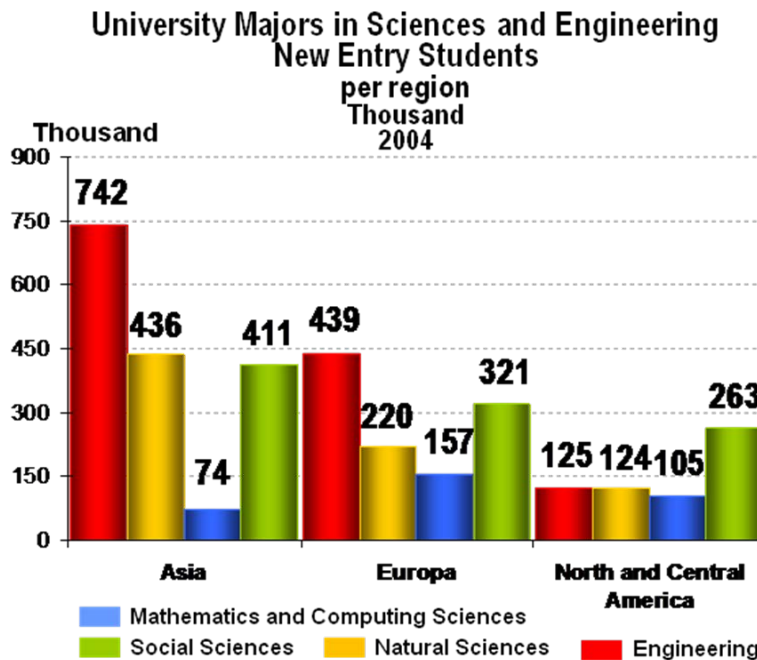
skilled people and professionals trained at educational institutions and systems of the highest quality.

Therefore, there is an essential need for the development of mathematics abilities and the approach to exact sciences beginning at the preschool and elementary levels, thus laying the grounds for knowledge in children and youngsters, and fostering interest, comprehension, familiarity and passion for these areas, in order to create a scientific, technological and innovative generation. According to the economist from *Stanford University*, Mr. *Eric Hanushek*, the GDP of a country is directly related to their students'² mathematical and scientific levels, subjects that should be taught at a very young age, as mentioned by world renowned experts³.

On the other hand, it is imperative to promote an education at the technical level, at high schools and at universities (public and private), with an appropriate mix in the development of techniques, abilities, skills, attitudes, and competences required in the strategic sectors of the MIKC Program, in order to fulfill the demand in the professions of engineering, exact and health sciences, as well as technological and technical specializations, which are in greater demand, with better opportunities of independent employment and development.

The next chart evidences how Asian regions, which are the economies with the most sustained growth in the last years, have begun to strongly position university majors focused on knowledge economy (Engineering, Mathematics and Computing Sciences).

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Source: ITESM. Self-elaboration with data from the OECD and Science and Engineering Indicators 2008.

For the strengthening of education and the development of human capital at all educational levels in the state of Nuevo Leon, it is necessary to **acquire vanguard content, materials and methodologies, as well as strongly promote the use of ICT's as a means for learning and spreading knowledge.** Through the latter, we democratize the access to education throughout the population and improve the educational and formative quality in all society segments.

To broadcast scientific, technological and innovative issues for society, and facilitate their comprehension through mass media, such as television, radio and the Internet, with educational content and formative methodologies, represents a strategic measure to enhance, motivate and enable society's participation on implied subjects within the knowledge region, economy and society.

In NUEVO LEON, the improvement and strengthening of education at all levels obey one of the key priorities promoted since the MIKC Phase 1 Program. According to the Minister of Education in the state of Nuevo Leon, Dr. Reyes Tamez Guerra, during an interview performed as part of the MIKC Master Plan Phase 2 elaboration, "... among MIKC's goals are those of Nuevo Leon retaking the educational leadership... being among the 3 highest rankings in the country... with educational quality, with innovative policies and programs that may fulfill that goal...that by the year 2018, according to educational indexes,

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Nuevo Leon is to be positioned as one of the best 10 educational systems in the world...[◊].

Taking into account the achievements obtained during Phase 1 (described in Chapter 3) and the initiatives planned by the state of Nuevo Leon government, as well as the recommendations derived from this research, it is proposed to **accelerate MIKC Program's development, growth and consolidation** by means of the following **programs and projects for the strengthening of Human Capital Education and Development**. For more detailed information, see Appendix II: Details on MIKC proposals and master plan for Phase 2: public policies, programs, projects, institutions and resource investment.

<p>EDC-01</p> <p>“EDUCATIONAL ECOSYSTEM FOR THE KNOWLEDGE SOCIETY” PROJECT</p>
<p>OBJECTIVE</p> <p>To transform and redefine the educational concept and systems in the state of Nuevo Leon through the promotion of MIKC. To open spaces for the access to knowledge and education from any place and for all the population; to count on a city which educates and supplies all citizens with services and formative options which may lead them to improvement and welfare of their community as well as to the innovation that may transform and drive our development.</p>
<p>MAIN COMPONENTS</p> <p>The educational ecosystem for the knowledge society consists of the following general components:</p> <p>What?</p> <p>1. Conceptual and Public Policy Design.</p> <p>The definition of new public policies for the educational sector is required, policies that will set guidelines and encourage the development of a holistic and integral learning system which comprises: innovation and entrepreneurship as a principle; the development of science and technology as a goal; the learning for life; the learning to learn; the education at work and for work; higher quality educational systems: versatile, flexible and open; new knowledge mediators, including ICT's; centers more involved in citizens' training; learning communities; social networks; new pedagogical models - student-centered, synchronous and asynchronous, applying knowledge to real life situations, multimedia inclusion, considering neuroscience innovations and how the student learns, based on processes and not memorization.</p>

[◊] Testimonials Collection from interviews carried out with International Experts and Key Actors of the State of Nuevo Leon for the elaboration of Monterrey, International Knowledge City (MIKC) Master Plan for Phase 2 (April- June, 2008).

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2. Legal

Visualizing new educational schemes, new financing structures and new participants in the educational field. This will include changes in legislation, agreements for inter-ministries coordination and mechanisms to certify the acquired competences, and the creation of decentralized organizations that support the implementation of the proposal.

3. Organizational and of Public Administration

Structural adaptation of the Public State Administration to knowledge's new demands. This will include the creation of a decentralized organization named: Knowledge and Technology Innovation and Transfer for Human Capital Development Center, dependent on I²T²; the creation of the Institute for Distance High School and University Education; the creation of Community Training Centers; the creation of Citizen Education Councils for education evaluation.

How?

4. Development of Educational Models and Programs

- Opening of new models for formal education

To generate new models for formal education, mainly those that will strengthen Junior High education, redesigning the Junior High education via satellite TV model and integrating new options for High School education, under the co-education plan and, in those urban locations which have the infrastructure, online programs delivered with the support from public and private higher education institutes in the State.

- Redefinition of didactic techniques and models.

To redefine educational models to cater different audiences and to redesign the teaching profession, as well as student access to knowledge.

- Programs for formal education

To strengthen the curricula of formal education programs: elementary, high school and higher education, and include in the educational system, that of education for life and for work, as well as to foster the learning of science and technology and transform educational programs into programs based on competences.

5. Development of Human Capital for Education

- Creation and development of a career system for professionals in education.

To count on qualified human resources, who will respond to the needs of the environment and to the new educational paradigms; who will foster the principles and competences that a knowledge society demands.

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- Permanent parents' counseling and training school.

To open permanent training opportunities for parents at all school levels and especially emphasize training in the control of addictions, a problem which has come to be in the first places, during the last years, regarding juvenile problems.

6. Integral Inclusion and Training Services

To create an urban establishment designed for high quality social interaction and with an advanced telecommunication infrastructure, which will offer integral inclusion and training services.

7. Evaluation and Certification

To reinforce the work of the Educational Evaluation Institute of Nuevo Leon and the Training and Competitiveness Board so that they may develop concrete actions. These will allow the measurement of State productivity within the educational environment, and promote job training and the certification of competences.

For whom and with what resources?

8. Target Population

The population the ecosystem will reach out to include: schooled population; non-schooled population; adult population; elderly population; citizens in general.

9. Equipment and Infrastructure

- Adapting and opening establishments for K-12 education, according to the demographic and educational services demands.
- Technological infrastructure to supply ICT's at strategic locations for a larger coverage: educational institutions, public locations.

10. Educational Establishments

Develop a Knowledge and Technology Innovation and Transfer for Human Capital Development Center, which will allow citizen access to innovation and knowledge generated by MIKC. This will be the cultural transformation motor for society as a whole, with a major impact on education and human capital development.

MEASUREMENT INDICATORS

Measurement indicators for this proposal may be found in Appendix II.

EDC-02

PROJECT: "FACTORY OF EDUCATIONAL CONTENTS" LINKED TO MIKC

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OBJECTIVE

To implement an Educational Contents Factory in NUEVO LEON that represents a support for the state educational system at kindergarten, elementary and high school levels in an effort to bring education in general closer to the population; above all, those subjects related to science, skills development, and the promotion of values at all levels of elementary and university education. This Educational Contents Factory will promote the use of ICT's for the creation, production, reproduction and spread of contents, being a support for both, teachers and students.

MAIN COMPONENTS

The new pedagogical model in the state of NUEVO LEON educational agenda, seeks a change with the introduction of a self-learning dose, which may allow citizens to be incorporated into the dynamics of the knowledge society by means of a digital culture (the use of computers and the Internet).

To encourage and accelerate the new educational and pedagogical model in the state of NUEVO LEON, the creation of the Educational Contents Factory is proposed to complement the use of ICT's in the public and private educational system, which will comply with the following components:

- To integrate a mix of licensed contents of their own from a national and international selection of the most important subjects related to the development of abilities, capabilities and attitudes.
- To teach basic sciences, social sciences and the development of creativity, innovation and entrepreneurship from kindergarten and elementary to high school levels.
- To create alliances with universities, public and private organizations at a national and international levels to enrich these contents.
- To achieve self-sufficiency through a business plan, commercializing and distributing the contents, products and services generated.
- To include plans that will complement the availability and access to educational contents at schools and by teachers through the use of ICT's.
- To produce contents for the development of abilities, attitudes and knowledge of personnel from business organizations and private and social institutions, encouraging efficiency, productivity, work quality, team work.
- To seek financing and donations from national and international organizations.

MEASUREMENT INDICATORS

- Capability of the factory to be self-sustainable in the medium term.
- Education enrichment through the implementation of educational contents at all

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levels (derived from ENUEVO LEONACE, PISA tests and others).

- Evaluation of services rendered to public and private clients.
- Development of its own technology (generation of copyrights and patents).

EDC-03

" EASY-FOR-ALL MATHEMATICS " PROGRAM

OBJECTIVE

The advances, projects and proposals in which the Government of NUEVO LEON has been working will be reinforced and intensified. Therefore, it is proposed to strengthen and deepen the processes, methodologies and contents of Mathematics teaching for K-12, both in public and private schools.

It is proposed to strengthen the quality of mathematics teaching at those levels in the state of NUEVO LEON, by incorporating the best methodologies, practices and tools for Mathematics teaching that exist at the international level to NUEVO LEON's educational model, and that they may be incorporated to all public schools and most private institutes. Additionally proposed is the alignment of study programs and plans focusing on Mathematics teaching; the reinforcement of the Mathematics teaching body with highly competent and trained teachers; the creation of enterprises that may provide the teaching of Mathematics for the population of children and youngsters in Nuevo Leon and the use of adequate educational tools for students and teachers.

MAIN COMPONENTS

- To implement the best methodologies for the teaching of Mathematics, by adopting the Singapore methodology (1st place in TIMMS tests, 2003), beginning with a pilot program, but trying to transform it into a massive program for elementary schools, both private and public. In the short term, the use of professional training courses for teachers and the alignment of school programs and materials, as well as to strengthen, improve and standardize the Mathematics level among teachers.
- To invite teachers from other countries, who are world-outstanding in Mathematics teaching, to come to Mexico in an exchange and collaboration program with a limited time period.
- To call for the best students of mathematics from high school and undergraduate majors in exact sciences, technology and engineering, et cetera to teach Mathematics classes in public schools of NUEVO LEON at preschool, elementary, junior high and high school levels, with a fair retribution.
- To offer the best students of Mathematics from public and private high schools

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a scholarship for a degree in Education or Pedagogy with a focus on Mathematics, to serve as teachers in that subject, at the elementary levels and offering fair retribution and incentives to motivate their participation

- To promote the creation of more enterprises and franchises that support Mathematics and Science learning among children and youngsters, applying the best methodologies and contents with international success, as a complement to that taught in schools.
- To expand the offer of games and contents focusing on Mathematics learning for kindergarten and elementary, integrating attainable products with successful international results, making them available at private and public schools.
- To create continuous education and professional development programs for Mathematics teachers in kindergarten, elementary and high school levels, as well as a yearly evaluation of their performance, both oriented towards knowledge and methodologies for the teaching of Mathematics, through the NUEVO LEON Sub-Ministry of Teachers' Development.

MEASUREMENT INDICATORS

- Results from PISA and ENUEVO LEONACE tests.
- Results from Teachers' Evaluation.
- Number of teachers trained for Mathematics teaching.
- Increase in the admission of young students to technical and undergraduate studies related to technology, engineering and exact sciences.

EDC-04

"PROGRAMMING AND HAVING FUN " PROGRAM

OBJECTIVE

To develop and reinforce the interest and abilities of children and youngsters in computer programming, from K-12 in all schools (public and private), in order to increase the possibility of training a greater number of students in technical careers and in undergraduate programs related to ICT's.

Therefore, several tools, which have been successful in other countries, are proposed, such as introducing children and youngsters to computer programming, according to their age and progress, which will evolve according to their development in computer programming learning, in order to develop their interest and ability in programming.

MAIN COMPONENTS

- To implement educational programs for computer programming, according to

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the students' age and knowledge. It is recommended at a first stage to use tools available in the market at a national and international level, (the proposal is further detailed in Appendix II) and giving preference to those that are free of charge, creating alliances or agreements with organizations that develop the selected programs.

- To implement curricular support materials and specialized courses with the support of public and private institutions of NUEVO LEON and/or organizations that develop the selected educational programs.
- To implement a training program for the teachers delivering the specialized courses and using the programs and support materials.
- To display the programs, free of charge, in all NUEVO LEON educational institutions, both public and private, from elementary to high school.

MEASUREMENT INDICATORS

- Acceptance level of programs, support materials and courses by students (number of users and rate of growth).
- Evaluation results about application and successfulness of programs, support materials and courses.
- Admission and graduation rates for higher education majors related to computing sciences (technical and university levels).
- Students' academic grade average (elementary, junior high, high school and undergraduates), that have taken the program.

EDC-05

"COMMUNICATION FOR KNOWLEDGE " PROGRAM

OBJECTIVE

1. To re-strengthen TV and Radio programs in NUEVO LEON with contents that may reinforce the scientific and technological knowledge, as well as the adequate spreading of an innovation and entrepreneurship culture. In order to achieve the latter, the private printing and electronic media in NUEVO LEON will also be involved and motivated.
2. To take advantage of the mass media power to support spreading the advancements of MIKC as a development model throughout the society, including results and favorable impacts on the life of the inhabitants.

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MAIN COMPONENTS

- To strengthen the present alliances of TV and Radio in NUEVO LEON with other international media, in order to increase access to the well of material available in other parts of Mexico and abroad, which may allow to reinforce the present TV programming and its link to different topics related to MIKC.
- To motivate and invite other local media, especially the important media groups based in NUEVO LEON, as well as academic and research institutions, for the development of contents.
- To organize different Science and Technology forums and events.
- To transversely promote the social communication of Science and Technology.
- To foster open and dynamic means of contact between the scientific community and society through audiovisual means.
- To carry out contests at educational institutions for the elaboration of contents, awarding prizes and acknowledgements to the first places.
- To promote the constant updating and training of professionals in social communication for Science, Technology, innovation and entrepreneurship.
- To counteract the so called “digital and technological gap” which separates some social groups from the access, comprehension, and use of new technologies, by adequately using the media to grant access from the most remote places, and training tools in collaboration with the educational system.

MEASUREMENT INDICATORS

- Number of spaces for programming of contents related to MIKC in science and technology, innovation, culture and entrepreneurship.
- Degree of participation with other public and private media for these issues.
- Number of productions with new contents linked to MIKC topics.
- Number of researchers and/or academicians, entrepreneurs, businessmen, innovators, artists and others, who participate in the programming and development of contents together with TV and Radio of NUEVO LEON.
- Number of national and international subscribed agreements and their level of success, through the reception of useful and quality material to enrich the NUEVO LEON TV and Radio programming in areas related to MIKC.
- Level and profile of “rating”, as well as the NUEVO LEON TV and Radio audience evaluation.

EDC-06

**" QUALITY EDUCATION FOR THE KNOWLEDGE SOCIETY " INTEGRAL
PROGRAM**

OBJECTIVE

To reinforce the goals achieved until now in the educational evaluation in the state of NUEVO LEON, by making some changes in the present Citizen Participation Technical Council, included in the current functioning of the Educational Evaluation Institute of the State of NUEVO LEON. This is proposed in order to separate activities of strict observance and academic analysis, those concerned with the involvement of parents and society, establishing for that purpose "Citizen Educational Councils." The latter may issue recommendations, not only for the improvement of curricula, pedagogical teaching methods, but also contribute in other efforts to strengthen the education in NUEVO LEON – such as the selection of new teachers through contest, the evaluation of teaching quality of the staff in regards to students' academic achievement in educational contents, as well as personal development reflected on the students' attitudes; and to promote certification of educational institutions -. Another proposition is to promote a strategy to fulfill the demands of the environment and encourage the use of new technologies in teaching, strongly increasing the educational level of the population in NUEVO LEON.

MAIN COMPONENTS

- To promote the healthy integration and operation of the "Citizen Educational Councils," grouped through the work and promotion of parents' associations interested on improving the educational quality of their children and, in general, of the state of NUEVO LEON, supported by independent professional experts in education.
- To design and implement a program that will increase the levels of requirements, certification and supervision for the operation permits of private educational institutions in NUEVO LEON.
- To evaluate the convenience that the Government of the State of NUEVO LEON request from the Federal Government the implementation of a pilot project for the decentralization of Educational Institutions operation such as in the case of: CBETIS, CECATIS, CETIS, etc., so that the technical education be adapted to the requirements related to professionalizing NUEVO LEON, and to be able to increase the supervision of their functioning.

MEASUREMENT INDICATORS

- Graduation rate in elementary, junior high, high school and higher education.
- Academic levels demonstrated in the entry tests to high school and university

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levels by the students of NUEVO LEON.

- Permanent training of the teaching staff and the use of new techniques and study tools.
- Level of inclusion of ICT's in the school programs.
- Tests results from ENUEVO LEONACE, CENEVAL and PISA.
- Students' acquisition of positive attitudes and values.

EDC-07

"VOCATIONAL TRAINING AND EDUCATIONAL PERTINENCE " STATE PROGRAM

OBJECTIVE

With the objective of updating, strengthening, deepening and boosting the educational congruence and pertinence in NUEVO LEON's knowledge society and economy, it is proposed to reinforce the work and the budget for the Labor Market Planning and Academic Labor Training Consulting Council through the implementation of an integral state program for the "Vocational Training and Educational Pertinence for the Knowledge City." On one hand, it is to be a profound and effective mechanism of vocational training for youngsters who are beginning a technical career or undergraduate studies; on the other hand, that it be a strategic instrument to forecast the technical and professional labor market and the opportunities for the development of independent technical and professional activities. Such research is of great value, both for students at the vocation decision-making and for the educational institutions, the business sector, and society in general.

MAIN COMPONENTS

In order to reinforce the very useful work in relation to studies about local professional and technical requirements performed by the Labor and Productivity Relations Council, the Ministry of Education, and the Ministry of Economic Development of the State of NUEVO LEON, methodological and diffusion improvements are proposed through a deeper alliance among: state government, business and academic sectors, parents' associations, and experts interested in the topic.

1. Integral system of vocational training focused on:

- Evaluation of the best existing methodologies and that have given positive results regarding vocational training, which may be massively implemented among all young people who are at the vocation decision-making stage (at the end of junior high and high school); and to considerably increase the current

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diffusion of research results for professionals and technicians required in NUEVO LEON.

- Effective coordination and linking among federal, state and municipal governments, business organizations and innovation and competitiveness cluster councils, trade unions, public and private educational institutions, citizen councils and the State Youth Institute for Young for the state of NUEVO LEON.
- Motivation and active participation by Parents' Associations.
- Technical-statistic refinement, updating and strengthening of the methodology, data bases and collection information used in the document Professional and Technician Requirements in NUEVO LEON, Trends and Forecast.
- Development of detailed profiles for labor positions offered by the local labor market.
- To have a permanently updated general directory of the complete educational offer in the available careers at all the public and private institutions of the state, both at the technical and at a professional level.
- To locate the venues (physical and virtual) where university graduates may have access to a previous training, once they decide to join the labor market (in those cases where necessary).
- Guidance for résumé writing and suggestions for job interviews.
- Linking with support programs for entrepreneurs.

2. Labor market forecasting system, trends and intelligence:

- Integration and periodic diffusion of research on trends and forecasts for the labor offer and employment opportunities in independent activities.
- To strongly consider an intelligence research for the high technology and innovation sectors and market segments with growth opportunities at the medium and long term.
- To transform the forecast and intelligence exercise into an instrument so that public and private universities of the state of NUEVO LEON may carry out a refinement and updating of their educational programs, through a plan of "recommended fees" for careers with less demand in the labor market, or with less opportunities for the development of independent activities (due to market saturation and/or scarcity).

MEASUREMENT INDICATORS

- Increase of the student population in technical, engineering and technology fields.
- Equilibrium in the labor market of NUEVO LEON.

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- Increase of salaries and average benefits based on the quotes from the Social Security of NUEVO LEON and on the turnover of wages and salaries in the state.

EDC-8

"DEVELOPMENT OF LABOR ABILITIES AND COMPETENCES" PROGRAM

OBJECTIVE

In order to have a greater number of trained and high quality personnel in the productive areas and those of greater development in NUEVO LEON, taking into account the supply and demand of the current labor market and its forecast, it is proposed:

1. To fortify the recently launched "Institute for the Development of Talents in Information Technologies" of NUEVO LEON, so that it may support other growing sectors, giving preference to those linked to knowledge activities.
2. To reinforce the "Labor Relations and Productivity Council of NUEVO LEON," as well as the Labor Training Institute (ICET in Spanish), through an important increase in budgeting resources that may allow to raise the development of human resources required by the strategic and developing sectors of the medium-high and high technology industry sectors, as well as intensive services in knowledge (OECD classification), according to MIKC objectives.

MAIN COMPONENTS

1. Talent training at the technical and professional level

- To expand IDETI (Institute for the Development of Talents in Information Technologies) activities towards the strategic sectors of MIKC, so that it become the "Talent Development Institute (IDT in Spanish)."
- To promote IDT's participation in training programs design based on extended research of labor supply and demand (see: "Vocational Training and Educational Pertinence" State Program), and that it mediate and consolidate the training supply (training programs, professional development and retraining) at undergraduate and technical levels, for active, non active and unemployed o workers, as well as for enterprises.
- To encourage the IDT to offer training programs for High School Technicians through a "Dual System" (joint programs between the academy and the productive sectors).
- To encourage the IDT to make alliances with educational and certified institutions of the highest level (universities, technical schools, others), in order

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to offer the training programs, including the use of ICT's in order to facilitate the supply of virtual courses.

- To encourage the IDT to have a web page and printed material with detailed information about the training offer, statistics and trends in the labor market and the strategic sectors of MIKC, among others.

2. Personnel training for trades and jobs requiring special abilities.

- To strengthen ICET (Labor Training Institute) in order for it to intensely focus its work toward those sectors with the greatest growth within MIKC.
- To adequately equip the existing training centers and open new ones, and/or to encourage subcontracting plans for the training of human resources by private certified institutions under competitive conditions.

3. Other aspects

- To encourage IDT and ICET to make their training courses also available to people with different abilities.
- To promote a "pilot" program for decentralizing the responsibility for technical education in NUEVO LEON (see proposal: Integral Program of Quality Education for the Knowledge Society").
- To promote that IDT and the Labor Relations and Productivity Council design and implement different scholarship and financing models for students and professionals, thus, increasing the opportunity to access training and development programs among a greater number of people.

MEASUREMENT INDICATORS

- Employability percentage for different IDT and ICET training programs graduates.
- Students' satisfaction level, as well as that of their employers.
- Employment and Unemployment rates in MIKC strategic sectors and those with the greatest development.
- Number of students enrolled in the IDT and ICET training programs.
- Number of graduates from the IDT and ICET training programs.
- Economic, public, business and academic resources allotted to IDT and ICET training programs.

4.1.2 Science and Technology, Knowledge and Intellectual Capital

The investment (in quantity, quality and with the right orientation) in science, technology and innovation, with the objective of generating,

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developing, transferring and applying knowledge and intellectual capital, to foster the social and economic development of a region, is one of the **fundamental pillars for the consolidation of a knowledge-based city or region.**

Therefore, **consolidation of the MIKC Program requires in the short, medium and long term high impact creative strategies that may promote and accelerate the scientific and technological development of the State and of the North-Eastern region in the country.**

The state of Nuevo Leon, in its evolution toward an international knowledge region, has established as its main characteristics the following: **to consider its inhabitants as creators or talents**; to be attractive to the creators from other cities and to enable their presence; to be a knowledge node to all networks and to have high level resources to train creators; to have necessary tools to make knowledge accessible to its creators; to consider each one of its resources and spaces as opportunities to inspire and generate new knowledge; and to connect its institutions with new urban infrastructure in order to create a network of innovation generators⁴.

Therefore, among the main factors required to accomplish these synergies is **Nuevo Leon's capability to make use of and access adequate and qualified human capital that fulfills the requirements of the strategic sectors and technological areas of the MIKC Program, and which is also focused on the development of innovations development required by society, entrepreneurs and businesses.**

One of the main characteristics of a knowledge city or region is the technological, innovative and creative nature of the economic activities that are developed, those of which depend to a great extent on the talents devoted to high intensity tasks in the generation and application of knowledge, innovation, entrepreneurship and, especially, their creativity⁵.

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**US Foreign Talent Impact
Public Enterprises¹ Founded by Foreigners
2005**

Sector	Number of Companies	Employees	Foreign Founders (%)
High technology manufacturing	60	282,442	42
Information technologies	34	48,794	24
Health sciences	30	18,660	22
Professional services	6	17,317	4
Other services	5	14,919	3
Other manufacturing	5	13,177	3
Financial services	2	8,872	1
e-commerce	2	234	1
Total	144	404,415	100

1) Businesses quoted in the Stock Exchange.

Source: ITESM. Self-elaboration from the document: American Made. The impact of Immigrant Entrepreneurs and Professionals on US Competitiveness.

Therefore, a knowledge city/region should constantly direct its efforts towards the creation of a favorable professional and urban environment, one that promotes and encourages innovation and entrepreneurship, but also, one that favors development, retention and attraction of highly qualified talents (national and international), specialized in areas strategic to the region. **Such is the case of the United States where 144 high-technology and innovation enterprises (which are in the stock market) have been founded by immigrants from different parts in the world.**

Another important factor to boost the economic development of Nuevo Leon from a model focused on sectors with a greater added value, and high technological and innovative content, is through its own research and development, or through the incorporation of knowledge developed and licensed in other regions of the world. It is, therefore, necessary to implement a program for the identification, evaluation, selection, transfer, negotiation and commercialization of available technologies or patents at the local, national and international levels, technologies which may be susceptible of being useful to the existing enterprises, in order to become more competitive and to grow; or for the creation of new innovating companies.

Within the framework of interviews performed to international experts for the elaboration of the MIKC Program Phase 2, Dr. Leonardo Pineda, Qubit Cluster Ltda. CEO, an expert in Regional Innovation Systems, explained that **“...a knowledge city is the result of a region’s deliberate policy based on a**

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strategy to modernize the productive engine and on technology transfer from research and development up to its commercial use for the development of that region through the creation of new technological enterprises...”.

It should be mentioned that the main cities and regions that have based their development on knowledge, have designed and implemented a legal framework, together with strategies and budget, so that their universities and research centers (public and private) be the generators of technologies and innovations that society, entrepreneurs and enterprises need, thanks mainly to the continuous improvement of their human capabilities and their investments in infrastructure and equipment, but they have also developed plans that allow them to make the best of and commercialize the technologies available in the market.

For MIKC the investments made in infrastructure for R+D+i, as well as the development of plans that enable the commercialization of generated and available technologies, are indispensable factors its consolidation and success.

Another factor for increasing the development of MIKC is **to promote and outreach science, technology and innovation among all actors of society**, as well as **to integrate expert forums in development and common interest areas** as a great tool to promote technologies and to display the advancements in the “Monterrey: International Knowledge City” Program, both nationally and internationally.

Considering the advancements achieved during Phase 1 of the program, for the strengthening of **Science and Technology, Knowledge and Intellectual Capital**, as well as the own recommendations derived from this paper, a series of projects and programs for MIKC Phase 2 have been proposed, which are **described executively in the following segments**. For more detailed information, see Appendix II: Details on MIKC proposals and master plan for Phase 2: public policies, programs, projects, institutions and resource investment.

CTC-01

"NUEVO LEON: TALENT MAGNET " PROGRAM

OBJECTIVE

To create and maintain a favorable environment, as well as to establish strategies to attract and retain highly qualified talents, complementary to the local talent in NUEVO LEON (especially MMA), and which is necessary to stimulate the generation of ideas and intellectual property, innovation and entrepreneurship, productive activities linked to knowledge sectors and to artistic and cultural activities; taking into account that these talents are necessary to

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foster greater economic, cultural and social activity in the state and, especially, in the strategic sectors linked to MIKC.

MAIN COMPONENTS

It is recommended to operate the program within a Decentralized Public Organization, following a narrow structure, which could be sectorized onto the Ministry of Economic Development in close coordination with I²T² (or vice versa).

1. Talent Attraction and Retention

It is recommended to design support and incentive programs for the attraction and retention of talents, which will value the inclusion of aspects such as:

- To offer temporary support to enterprises and institutions that hire highly qualified talents (an example of which may be a certain % of the salary).
- To offer support for housing, children's education, major medical insurance, etcetera, with mixed resources from the state government and the employer, for those talents qualified as strategic for retention or attraction to NUEVO LEON.
- To relate the incentives to an intellectual property generation results parameter, valuable for the economic and social development of NUEVO LEON/ MIKC Phase 2.

In order to be successful, the program will be considered TOP priority. Therefore, it is recommended that an important budget be allocated from the first year of operation (it is recommended to begin with at least \$50 million pesos).

3. Favorable Environment

For MIKC to attract and retain the talent necessary to successfully drive knowledge-based economic activity, it is necessary to create a favorable environment for the following elements:

- Professional Development Opportunities, flexible working schedules based on objectives, home office working contracts, and flexible attire and office facilities adequate to the development of the potentialities of the human resources considered talents.
- Quality and Life Style in an Urban Environment, promoting culture and art, constructing and modifying urban and residential areas, improving quality of life (and all that this implies); promoting sports and the use of natural attractions in the region; creating adequate and attractive environments for families; encouraging a diversified society, tolerant and open to ethnical, cultural and social issues; improving public safety; fostering the diversity of entertainment and leisure activities inside and out of the urban environment, among others.

MEASUREMENT INDICATORS

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- Success in the retention of local creative talents (mainly graduates and postgraduates).
- Results from opinion surveys to monitor the improvement of conditions in MMA, regarding the priorities emphasized by the talent profile.
- Number and percentage of patents obtained and registered by local residents, national and international foreign residents.
- Degree of highly qualified personnel turnover in those companies with a high demand for specialized human resources.
- Number of migration applications (from foreigners considered talents) to reside in NUEVO LEON, in relation to their incorporation to labor demand required by strategic sectors linked to NUEVO LEON/MIKC, and the percentage of success regarding the corresponding FM3 permits.
- Number of new companies, impact and growth rates, created by foreign talents (national and international) attracted to Nuevo Leon.
- Number of other knowledge talents attracted to MMA in other activities linked to knowledge (physicians, artists, scientists, etc.) and the evaluation of their economic and social impact, and their growth rate.

Indicators related to the capability for talent attraction and retention:

- *Talent Index*: concentration of a population older than 18, with university degrees.
- *Tech Pole Index*: concentration of activities related to technology (amount of industries and jobs related to knowledge).
- *Mosaic Index*: concentration of foreigners in the city.
- *BoBo* (Bourgeois-Bohemian) *Index*: concentration of artists in a city (example: writers, designers, painters, etc.).

CTC-02

**"TECHNOLOGY PROMOTION AND COMMERCIALIZATION CENTER "
PROJECT**

OBJECTIVE

To create the Technology Promotion and Centre of NUEVO LEON (PCT-NUEVO LEON), with the objective of identifying the best technologies available at the national and international level, those which will support the competitiveness and growth of the productive sector of NUEVO LEON, as well as foster the creation of new technology enterprises. PCT-NUEVO LEON will seek the bonding between the technology and innovation's strategic value in the state of NUEVO LEON in

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the context of MIKC, to richness generation and economic spillover, besides improving the competitive level of the local productive sector by establishing a link between the latter and other institutions, agencies and enterprises generating and commercializing technology at the local, national and international levels.

MAIN COMPONENTS

It is proposed that PCT-NUEVO LEON function with a think-tank structure, which will enable specialized work in MIKC's strategic knowledge sectors and areas, for the following tasks:

- To generate and manage a database; spread and promote technological supply the property of which lay in the hands of institutions or independent researchers of NUEVO LEON, at local, national and international events for this purpose.
- To perform and spread research on technological trends with business opportunities in the region and based on a global vision.
- According to NUEVO LEON's productive sector's and entrepreneurs' requirements, carry out the necessary research to identify, evaluate, acquire, spread and promote the use of the best technologies available at a local, national and international level; always submitting to competitive negotiation processes and respecting the corresponding intellectual property.
- To identify technologies generated by the universities and research centres (public and private) in the region in order to evaluate its application and commercial interest and to direct the institutions' technological supply towards the local market, at first, and then toward national and International markets.
- To offer technical support in the economic valuation of technologies and in the development of promotion and commercialization processes.
- To render assistance to technology developers in Monterrey and in the state of NUEVO LEON regarding industrial and intellectual protection processes.
- To participate in the identification of technological needs in the region.
- To render coordination and networking services between technology suppliers and buyers.
- To promote nacional and international agreements to spread and promote the commercialization of technologies already applicable or with a potential of applicability.

MEASUREMENT INDICATORS

- Total volume of resources raised by researchers at universities and research centers of the state, due to commercialization of licensed technologies under the center's promotion.
- Total economic resources managed in the licensing transactions for local,

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national and international technologies, promoted by the center.

- Impact evaluations of users benefited by the promotion and commercialization of technologies operated by the center.

CTC-03

TWO BIG “SCIENCE AND TECHNOLOGY” YEARLY EVENTS

OBJECTIVE

To have two big International events per year in Monterrey (or its Metropolitan Area), to promote, spread, outreach, and link topics related to strategic sectors in MIKC between different actors of Science and Technology. These topics are of great interest to the economic and social development of NUEVO LEON, and their outreach will gradually integrate society, entrepreneurs, businessmen/businesswomen, researchers, public officers, mass media and opinion leaders.

MAIN COMPONENTS

- To promote, spread, outreach, link and sensitize society toward Science and Technology subjects through these events.
- To display in a single platform products, services; projects, both for research and real life application; and relevant issues related to MIKC fostered strategic areas and sectors.
- To link supply and demand of Science and Technology services (Example: technology commercialization), building collaboration networks among companies and other institutions, attraction and retention and training of strategic talents’ networks.
- To offer attractive support topics to the community, entrepreneurs, businessmen/women, researchers, public officers and students at all levels.
- To also function as a national and international promotion instrument for the region, attracting the attention of companies (and investment), researchers, universities and talents, and helping it to position itself in the world as a knowledge city.
- To consider strategies and actions to enable the event’s self-sufficiency in the least possible time (once the “seed capital” is given) so that the exhibitors generate an economic spillover for the State.

MEASUREMENT INDICATORS

- Degree to which the promotion was achieved under a supply – demand scheme for services within Science and Technology.

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- Attendees' number and profile.
- Event evaluation by attendees and exhibitors.
- Number of scholarships promoted, requested and obtained.
- Employment exchange functioning among participants.
- Management of seed capital promotion and funds from angel and risk capitals among entrepreneurs and enterprises with projects and interested equity investors.
- Number of collaboration networks established among companies and other institutions during each event.
- Number of talent networks established during each event.
- Intellectual Property Promotion achievements.
- The event's self-sufficient economic achievements in the least possible time.

ADDENDUM-CTC-01

APPENDIX I: TECHNOLOGICAL RESEARCH AND DEVELOPMENT: LINKS BETWEEN NUEVO LEON'S TECHNOLOGICAL AREAS AND STRATEGIC SECTORS

The state of Nuevo Leon has highlighted 10 Strategic Sectors for its development as a knowledge region: Information, Automobile, Health, Household Appliances, Aerospace, Metal-Mechanics, Plastics, Ceramics, Agribusiness, and Food Industry. These are supported through 5 Technological Areas: Biotechnology, Mechatronics, Information Technologies, Health Sciences and Nanotechnology. Appendix II clearly details research and development opportunities in the association between selected sectors and selected technological areas, through a general analysis based on the Barrios Sierra research area classification system. For deeper analysis, more time and resources are required.

4.1.3 Innovation and Entrepreneurship Culture

Encouraging an innovation and entrepreneurship culture, with the objective that an important percentage of the population develop these skills and abilities, with a global approach and social and environmental responsibility, has been considered extremely important for the success of the regions that have bet on knowledge-based development.

On the other hand, **globalization and technological revolution** have increased the **opportunities for the generation, application, and exchange of ideas and knowledge to boost world economic and social advancements.** In addition, international competition prioritizes the concentration of regional

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conglomerates in different specialization areas that enable them to stand out and position themselves in the global market by focusing on productive activities that are highly linked to innovation, science, and technology. These are precisely the activities that enable knowledge-based competition and its generation, diffusion, and adequate usage.

To achieve Nuevo Leon's integral and sustainable development, it is fundamental that the **productivity and integration of the productive sector be carried out under collaboration schemes to achieve high competitive standards**. In MIKC's Program Phase 1, one of the most important achievements has been the creation of clusters, where the productive sectors work in close collaboration towards common goals. Based on other successful cities' example, such as Montreal, San José (California) and Seoul (South Korea)

For the MIKC Program, Phase 2, it will be of utmost importance to continue encouraging this kind of collaborative work for the benefit of the productive sector, through public policies and a coordinating and support institution for the strategic clusters in the region.

Another key factor for the promotion of innovation is in the **generation of knowledge and intellectual capital to foster the economic and social development of the region**. Dr. Leonard Pineda, Qubit Cluster Ltda. CEO, an expert in Regional Innovation Systems, during the same interview described above, explained that *"...a key aspect to strengthen for the successful development of a knowledge-based economy is the institutional framework of intellectual property, copyrights and patents..."* It is a proven fact that knowledge becomes wealth and it is better distributed when it becomes clear that commercialization is of utmost importance. The commercialization of technological developments, scientific discoveries and innovations achieved by technicians, researchers, professors, entrepreneurs, enterprises and businessmen/women is to be carried out with the proper intellectual protection.

To reinforce the encouragement for innovation and entrepreneurship, it is indispensable to create the infrastructure and equipment that will enable this knowledge to transform into tangible goods and services for the markets and society in general. At the same time, it is essential to create networks that integrate the actors in education, R+D+i, and productive and financial sectors so that researchers and businessmen/women can formalize their collaboration networks through business exhibitions, conferences, seminars and events organized for the promotion of these technological, market and other types of information exchanges, which many times ends results in the creation of new high innovation and technology-based enterprises, such as the case of the regions of Austin (Texas) and Boston (Massachusetts)⁶.

Additionally, **productive investment** is required **in science and technology but, above all, in innovation enterprises**. In any productive system linked to

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innovation, it is essential to count on an adequate financing system and the availability of enough seed and risk capital to transform knowledge implementation into wealth, which has a direct impact on the GDP, with the objective of energizing the economic growth of the region and encouraging the generation of higher quality jobs.

However, the conventional financing systems for traditional enterprises do not generally adapt to the needs intrinsic to innovation and technology, because these are riskier and years longer to mature. Because of this, it is essential for MIKC's Phase 2 to prioritize the promotion of investment under angel or seed and risk capitals, learning from our Phase 1 experience on these financial access schemes.

In this way, Nuevo Leon businessmen/women and investors may invest in projects related to medium and high technology sectors, which are knowledge-intensive.

Considering the advancements achieved during MIKC's Phase 1, together with the proper recommendations derived from the present work for the strengthening of an **Innovation and Entrepreneurship Culture**, a series of **projects and programs for MIKC Master Plan proposal Phase 2. These are described executively below.** (For more details, see Appendix II: Details on MIKC proposals and master plan for Phase 2: public policies, programs, projects, institutions and resource investment).

CIE-01
“ INNOVATION AND ENTREPRENEURSHIP EDUCATION” PROGRAM
OBJECTIVE
To implement, from preschool and elementary educational levels, classes and contents with the best international methodologies related to developing innovation and entrepreneurship; that may be feasible for acquisition by public and private educational institutions of NUEVO LEON; in hopes that, in time, there will be many more young people and adults capable of increasing the economic, social, cultural, and political development of NUEVO LEON, supported by innovation and entrepreneurship skills, attitudes, and abilities in the activities in which they develop.
MAIN COMPONENTS
<ul style="list-style-type: none"> - To obtain methodologies, materials, and equipment to support these activities, such as innovation laboratories suitable for the different educational levels. - To promote the use of pedagogical methods in the educational system to effectively develop the students' reading, entrepreneurship and innovation skills.

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- To identify and then transfer those effective didactic methods and infrastructures to the development of innovation and entrepreneurship competences.
- To widen and extend the use of ICT's for teaching and learning purposes in the educational establishments across the state of NUEVO LEON.
- To stimulate curiosity for new things, creativity, and entrepreneurship throughout preschool teaching.
- To use pedagogic methods that stimulate initiative, experimentation, and innovation, the abilities to approach and solve problems, and the ability for team work and to face, negotiate and solve conflicts.
- To strengthen current alliances between NUEVO LEON Television and Radio and other international media, to gather large amounts of existing material that enables the strengthening of the current schedule and its relationship with the promotion of innovation and entrepreneurship topics.

MEASUREMENT INDICATORS

- Results from the poll proposed for the higher educational institutions about student performance during the IMPULSA in NL Program.
- Results from students taking the selected contents and methodologies.
- Student appreciation for receiving these contents.
- Results from self-developed methodologies selected for NUEVO LEON.
- In the medium and long term, the impact achieved by the growing number of entrepreneurs bringing new and innovative enterprise projects to business incubators in NUEVO LEON.
- Program impact on enterprise creation and growth, especially the most innovative.
- In the long term, the creation and success of innovative enterprises in NUEVO LEON (very particularly in MMA) and their participation in the GDP and employment for NUEVO LEON.

CIE-02

**“INTELLECTUAL PROPERTY FOR KNOWLEDGE-BASED DEVELOPMENT”
PROGRAM**

OBJECTIVE

To increase the participation of NUEVO LEON in the decision-making related to the distribution of support funds committed to Science and Technology in Mexico,

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in a way that through MIKC it can be a national “pilot” project. It will have as an objective the promotion of a larger generation, registration, commercialization, and patents use, and to achieve a greater influence by the State Government of NUEVO LEON in the evaluation and approval of projects at the FOMIX (Mixed Funds) and Sector Funding supported by CONACYT, as well as in the granting of scholarships and other existing support instruments, to achieve a greater relevance and that they be directly linked to the priorities of the economic and social development of NUEVO LEON, fundamentally for MIKC.

MAIN COMPONENTS

- To design, negotiate, and sign an agreement with CONACYT to create a pilot decentralization program responsible for activities that are carried out by this organization, in order to give larger faculties and responsibilities to the state of NUEVO LEON, so that the results of promoting Science and Technology are strengthened.
- To achieve an initial investment of at least \$250 million pesos from the Government of NUEVO LEON, jointly with the resources obtained from the Federal Government through CONACYT and the Ministry of Economy, the SAGARPA, the SCT, SENER; to establish the commitment to increase this investment in at least 10% a year in real terms, every year, in the subsequent administrations.
- To increase the incentives for investment projects in selected sectors of knowledge for NUEVO LEON, and to encourage the Federal Government to follow suit.
- To consider the implementation of the award “*A millon la Patente*” (A million per patent), through a shared fund between the State and Federal Governments, which may be qualified by a committee of high-ranking experts as having a high impact in the economic and / or social development of NUEVO LEON.

MEASUREMENT INDICATORS

- Success in the achievement of a good and responsible decentralization agreement between the Government of Nuevo León and CONACYT, which allows it to considerably increase its level of influence and decision regarding the administration of resources, programs and entities related to science and technology in Nuevo León.
- Number of patents in process that achieve their registration in the IMPI and the USPTO.
- Their evaluation by professional specialists.
- Measurement of results from the decentralization process.
- Results in the retention and attraction of scientific and technological talents in

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NUEVO LEON.

- In the medium and long term, the increments in the GDP and employment related to industrial activities of medium – high and high technology, as well as intensive services in knowledge.

CIE-03

**“TECHNOLOGICAL BUSINESSES: FINDING OPPORTUNITIES” PROGRAM
LAUNCH**

OBJECTIVE

To encourage the creation of an ecosystem which will help entrepreneurs and businessmen/women of NUEVO LEON to have better tools to identify and evaluate business opportunities with a greater technological content and innovation level. Likewise, the objective is to generate the mechanisms that will help channel a larger investment into those sectors, to encourage the growth of the state's and MMA's GDP, as well as the generation of more better quality jobs.

For this, we recommend the implementation of the program in alliance with business organizations, academic institutions with programs for the incubation and acceleration of enterprises, and with the strong support from the state and federal governments, in order to obtain incentives for the technological entrepreneurs of NUEVO LEON.

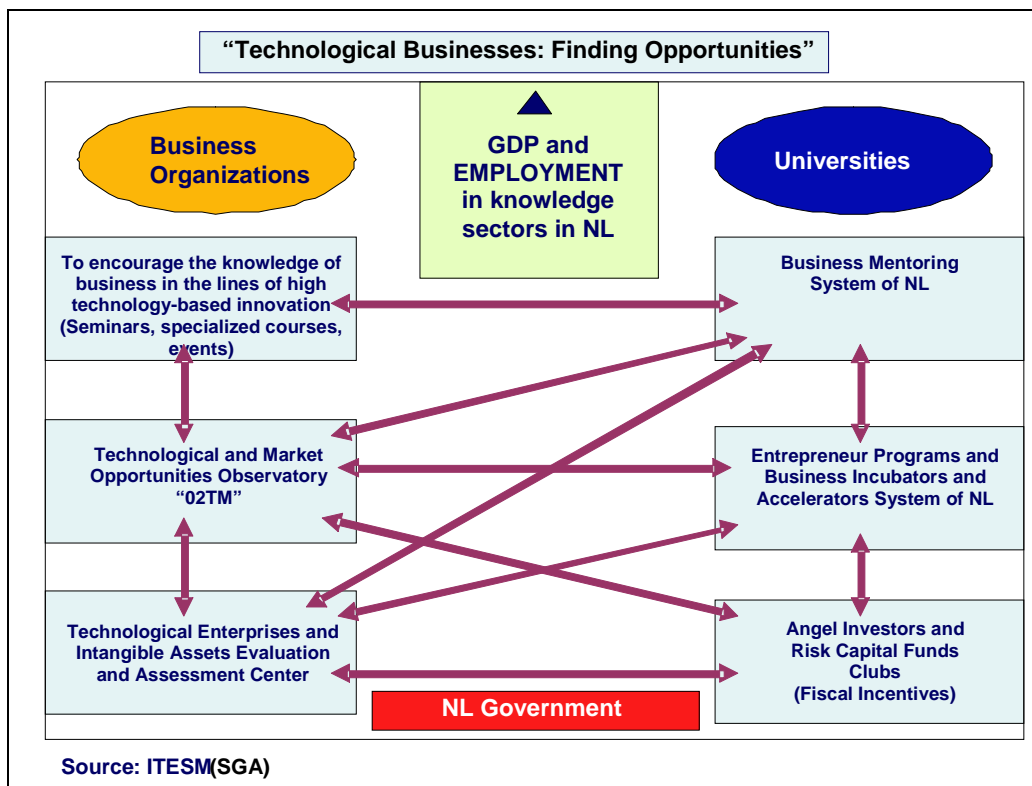
MAIN COMPONENTS

- To promote many more seminars, specialized courses, and events related to the development of innovative and high–technology businesses, in alliance with the local and some foreign institutions, which should have great experience in the area of technological opportunities and businesses.
- To promote the participation of state entrepreneurs and businessmen/women in international events which allow them to approach and discover business opportunities, alliances, and conversions in the area of technology.
- To strengthen the Business Incubators and Accelerators System of Nuevo Leon, which will take into consideration the strengthening of existing infrastructure (mainly in universities), the increase of support both from the state and from the federal government (through the SE and CONACYT), and above all, the increase of the participation of the business sector, both with the possible opening of some business accelerators in the business chambers and organizations (or by participating in those already in universities), as well as with the organization and strengthening of a Business Mentoring System of NUEVO LEON.
- To permanently monitor the identification of the strategic sectors with high

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added value, and their particular and most convenient “niches” for NUEVO LEON, as well as to bet on the promotion for local, national, and foreign investment.

- To implement an “Technological and Market Opportunities Observatory” (O2TM) with the task of performing intelligence work with a global vision which will enable it to identify those opportunity niches in MMA and NUEVO LEON on which it would be convenient to engage.
- To promote the creation of more angel and risk capital funds’ investment clubs in NUEVO LEON, encouraging the participation of local, national, and foreign businessmen/women with experience in investment in high innovation and technology enterprises.
- To create a “Technological Enterprises and Intangible Assets Evaluation and Assessment Center”, which could work as a valuable support for entrepreneurs, and also as a filter to identify the projects with high probabilities of success from those without it.



MEASUREMENT INDICATORS

- Number of patents requested per strategic sector linked to MIKC.

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- Number of projects revised by the Technological Enterprises and Intangible Assets Evaluation and Assessment Center
- Number of businessmen/women and executives that participate in the mentoring system of NUEVO LEON.
- Incubators: total of new enterprises, number and percentage of those classified in the knowledge sectors (OECD classification), critical sales mass, employment, and operational utilities generated.
- Accelerators: number of supported companies, total critical sales mass, jobs, operational profit.
- Resources invested in seed capital (public), angel capital (public and private), and risk capital (private), in companies of NUEVO LEON; the annual growth percentage and annual profitability.
- Export percentage of manufactured goods and services with high technological content from NUEVO LEON over the total (OECD classification).
- The most important indicator: GDP and employment percentage that begins to be linked to knowledge sectors (OECD classification) and the selected strategic sectors in NUEVO LEON; and their annual growth percentage.

CIE-04

"CAPITAL FOR INNOVATIVE ENTERPRISES" PROGRAM

OBJECTIVE

To encourage the evolution of the economy of NUEVO LEON (especially in MMA) through the gradual orientation in the generation and expansion of enterprises in the sectors with the greatest added value, innovation and technological content, in other words industrial, commercial, and service enterprises that generate better paid jobs and have a greater profitability. This should be done through a private investor's fund which will be endorsed by a governmental contribution, which will itself grant enough "seed" capital for the best technologically-based projects within their first development stages and which are in the incubators, and risk capital to support the expansion of operating enterprises with important growth indices which require new capital injections (those with an approximate 15 to 25% annual growth).

The main role of the public contribution will be to serve as an incentive for the participation of private capital through risk reduction for private investors. Therefore, the proposal is that this capital serve only as a third contributor, so that the investors themselves be the ones performing an adequate evaluation of the projects they face, enabling the gathering of shareholder businessmen/women into "angel investors clubs" and different risk capital funds,

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complying with the demand for projects per specialization degree.

MAIN COMPONENTS

Projects in their first development stages

- To increase the efforts in the promotion and strengthening of incubators and accelerators for high added value, innovative enterprises, and be able to count on enough angel or “seed” capital for the best projects in their first development stages and which are in the incubators; and risk capital to support the growth of operating enterprises, with important growth indices, which require new capital injections.
- To create a fund to be operated by the SEDEC and the involvement of the I2T2 from Nuevo Leon’s Government, so that, according to “best international practices” studied, it may function as a “fund of funds” carrying out only second-floor operations in response to the demand for investment projects that could easily be funded by “angel investors clubs” and specialized risk capital funds.
- To have a fund with a minimum cash injection of at least \$250 million pesos from an initial governmental contribution.
- To count on the participation of the Government of the State of NUEVO LEON, to participate only and exclusively as a third-party contributor, not directly.
- To consider that its implementation be through a Public Investment Trust, which may receive contributions from the municipal or state governments of NUEVO LEON, the federal government, and from other national and international institutions (such as the IDB’s MIF) and associations, investing through private funds. Because of this, its functioning is known as “second floor”.
- To achieve the necessary promotion so that the Federal Government may consider implementing a tax incentive to the profits generated by “Angel Investors Clubs” investing in enterprises’ and projects’ first phases of operation.

MEASUREMENT INDICATORS

- Number of enterprises supported by the program “Capital for Innovative Enterprises” in Nuevo Leon.
- Comparative operational results, before and after capital contribution for participating enterprises (sales, jobs, profits).
- Number of foreign high–technology enterprises generated or installed in Nuevo Leon.
- In the medium term, results from the return on the investment contributed by the “Capital for Innovative Enterprises” program trust.
- In the long term, the GDP participation percentage increase in NUEVO LEON for industrial enterprises classified by the OECD as medium–high and high

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technology, and from the knowledge-intensive services sectors.

- Others (e.g. number of applications received, virtual visits to the project's homepage, total number of approved projects, total amount invested, total added value generated by investment, added value generated by investment per type of industry).

CIE-05

"COLLABORATION FOR COMPETENCY: COOPETENCY" PROGRAM

OBJECTIVE

To create a Decentralized Public Organization (DPO) sectorized to the Ministry of Economic Development of NUEVO LEON (SEDEC), which will coordinate, follow-up the elaboration, implementation and adherence to each cluster's master plan in NUEVO LEON, and evaluate the recommendations adopted by the programs, projects, supports, and other actions to insure the successful integration of each one of the current and future productive clusters that have been promoted and organized, in connection to MIKC, in NUEVO LEON.

The suggested DPO will also support, through a slim structure but with a high professional level, the integration of the best international practices which suit each cluster, among which we can find the "regional innovation systems", and seek the best way to present financing options for the projects approved for each cluster.

Likewise, mechanisms should be designed to encourage a close collaboration between the clusters under the *coopetency* strategy to achieve an international strategic position within the framework of MIKC Phase 2.

MAIN COMPONENTS

- To support each of the clusters with research, analyses, evaluation, and proposals, derived from the best working practices from the clusters and regional innovation systems, for their analysis and decision.
- To support the elaboration of each cluster's work plans, as well as their adequate implementation, follow-up and updating.
- To help with the management of public, private and institutional resources, to assist the implementation of cluster work programs, both at a group level and, as possible, in an individual manner for the members who require it.
- To submit the initial budget needed for the DPO operation proposed to the state executive.
- To support the promotion of foreign trade programs and encourage local, national and foreign investment in the clusters.

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- To encourage the participation of the financial sector, as well as that of angel investors clubs and risk capital funds, in the different clusters. To move away from the participation approach of same-sector enterprises to enterprises from a “value chain”.
- To adopt measures for regulatory improvement, simplification, encouragement, and incentives of the productive activity through the support of the main requirements that will be identified and prioritized in the different clusters.
- To propose and coordinate enterprise support mechanisms for the businesses that constitute the different clusters, in regards to their needs for financial backup, consultancy, technical assistance.
- To maintain a permanent consultation with the members of the clusters on relevant aspects which have an impact and may boost their economic activities.
- To formulate and propose the actions that will boost the creation of technologically-based enterprises that will contribute intellectual value and capital to the cluster.

MEASUREMENT INDICATORS

- Competency is achieved in each organized cluster in NUEVO LEON, reflected by indicators such as the following:
 - o Growth of the enterprises that constitute each cluster (sales, employment, export, profit, tax payments).
 - o Inherent sector growth and its impact on NUEVO LEON’s GDP.
 - o Creation of new enterprises that support the growth and strengthening of each cluster.
 - o Increase in the investment on collaboration projects for competency in each one of the clusters.
- Local, national, and foreign investment, with the objective of promoting each one of the clusters in the state of NUEVO LEON and MMA.
- Evaluations carried out by the Presidents of the different clusters and their members on the work performed by the new DPO proposed.
- Employment amongst the members of each one of the clusters (number of new vacancies occupied by specialized workers, hired technicians and professionals from NUEVO LEON, their growth rate, with a special emphasis on the strategic sectors; and the average improvement of salary rates and benefits, based on IMSS medium quota, for each cluster).
- Resources obtained, with DPO support, in credit grants and angel and risk capital, for the participating enterprises in each cluster, as well as technical and administrative support services administered at different cluster member

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enterprises, and their evaluation by those receiving this support. A special emphasis will be placed on MIKC-linked clusters.

- Interaction level between cluster industries and the university and research institutions that support them.

ADDENDUM-CIE-01

**APPENDIX I: RECOMMENDATIONS TO STRENGTHEN THE CURRENT
“LAW FOR PROMOTING KNOWLEDGE–BASED DEVELOPMENT”**

(see details in Appendix II)

Integral and systemic aspect: we consider of utmost importance not to miss the opportunity to maintain, through this Law, the integral vision that a knowledge city must have.

The Law proposal is very positive in regards to the encouragement of knowledge and technological innovation, and has some general contents in other areas, such as education. However, it is very important to strengthen even more the transversal characteristic of the strategies, objectives, projects, actions, and the participation of other areas which are not present in the proposal. We recommend many more aspects be included in areas such as the following:

- Social aspect: it is fundamental that this be included as an important component in the development of a knowledge city, to ensure that the benefits of knowledge–based development are accessible for all the different socio–economic strata, and so inclusion and social mobility may exist and can strengthen it.
- Urban development planning.
- Infrastructure in general and urban equipment (including mobility, logistics, transportation, telecommunications infrastructure, etc.).
- Environment and sustainability.
- To strengthen areas such as education and human capital development.
- To broaden the definition of “International Knowledge City”, and considering definitions from other international organizations, such as the IDB, the World Bank, the OECD, and others, so that ours be more integral and systemic.
- Greater involvements from the Ministry of Economic Development, for which we have proposed the consideration of the Minister of Economic Development as the State Governor’s substitute Representative before the General Council and the I²T² Government Board.
- To highlight the work of the Ministry of Economic Development (SEDEC) in the promotion and attraction of national and foreign investment for the medium–

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high and high technological sectors, as well as for intensive knowledge services, due to their strategic role in the promotion of a knowledge city. To emphasize the promotion and configuration of high technology-based innovative enterprise accelerators, which are as important as incubators.

- To review and evaluate the faculties of the SEDEC and the I²T², clarifying the proper and complementary activities, and the coordination which should exist between both institutions, in order to strengthen their complementarity and synergy.
- To carry out same analysis regarding the I²T² and the Science and Technology Coordination of Nuevo Leon, as well as the Science and Technology Council of Nuevo Leon.
- To evaluate the feasibility for increasing the scope of the Ministry of Education activities linked to the promotion of knowledge and technological innovation, adding other important aspects (see details in the corresponding Appendix).
- To insist on evaluating the convenience and possibility of transforming the Law and the General Council for the Promotion of Knowledge and Technology Innovation Development into a more integral entity, which seeks the development of MIKC in every field, and which will precisely become the project's systemic vision strength.
- To add a segment to article 10 regarding the General Council functions, where the State Executive can present proposals to the Federal Executive, the Federal Congress and the Republic's Senate, which can support the fulfillment of objectives stated in the law. It is very important not to depend only on what is possible to encourage at a state and local level.

4.1.4 Urban Infrastructure and Equipment

A society that seeks an integral knowledge-based development has to work in every possible way toward the democratization of economic, social, and cultural development, as well as the improvements in the populations' quality of life. In other words, they are to become accessible for all socio-economic segments, to generate personal motivation among its inhabitants and a feeling of hope that a fair society and city may exist, where everyone has access to economic and social mobility through personal and collective efforts.

In the urban planning of a knowledge city, it is important to take into consideration that the city is the clear reflection of the values and aspirations of its inhabitants, who build it with their daily activities.

Regarding Monterrey's Metropolitan Area (MMA), an urban infrastructure in terms of mobility, coexistence, equipment and image should be encouraged, so that it may benefit every socio-economic sector of the

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population, and avoid as much as possible the generation and increase of segregation and inequality conditions.

Based on examples observed in other successful knowledge cities, the urban infrastructure and equipment should **generate the appropriate environment for its knowledge-based development**, this is, there should be a **healthy and balanced urban growth** that offers its inhabitants a **high quality of life** and gives the **highest priority to environmental issues**. The wealth of a knowledge society is reflected in the physical environment it occupies, through the sight of its plazas, streets, hospitals, specialized buildings, services and other urban equipment. Likewise, it is important to make efforts to **encourage the cultural and artistic activities in the city**, for these are also fundamental aspects of a knowledge society, which encourage creativity and offer more recreational attractions to its inhabitants.

Another fundamental aspect is **urban mobility**, term that includes all the means of transportation of a city such as cars, buses, subway, bicycles, pedestrians, etc. In Barcelona, nearly half its inhabitants (54.6%) travel by foot or bicycle; 30.4% use public transportation and only one fourth (24.0%) of the population use personal automobiles.

Urban mobility has an important role in the development of a knowledge city given their conditions to **satisfy the demand, both personal and work-related, of its inhabitants**, and at the same time to free the citizens of every socio-economic sector from worries such as traffic jams, parking spaces, fuel expenses, toll payments, commuting, among others, and benefit them through the optimal use of their money and time, through an adequate planning and investment on infrastructure, urban equipment, and transportation, which will allow the satisfaction of most mobility needs through the safest, most efficient, sustainable and competitive options.

As part of the urban infrastructure and equipment, consider the **intelligent use of Information and Communication Technologies (ICT's) throughout the society**. ICT's improve interaction between the inhabitants of the cities, in such a way that it is possible to boost sustainable economic and social development⁷. Included within the criteria to evaluate intelligent communities, is the development of broadband communication networks, used by businesses, the government, in management processes of urban services, and in the development of digital democracy, which ensure the access to the ICT's benefits to all the sectors of society⁸, thus promoting democratic access to Knowledge and its benefits.

To strengthen urban Infrastructure and equipment projects for MIKC, a series of **project reforms, programs, and proposals the MIKC Program Phase 2** are proposed, and they are **executively described below**. For more information see

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Appendix II: Details on MIKC proposals and master plan for Phase 2: public policies, programs, projects, institutions and resource investment.

INF-01 "FOR A BETTER METROPOLITAN DEVELOPMENT" INSTITUTIONAL REFORM
OBJECTIVE
To have an adequate legal and institutional framework so as to develop the strategic projects related to the planning and management of MMA's urban development, which will allow to encourage what the "Monterrey International Knowledge City" Program implies regarding urban infrastructure and equipment, generating added value for the society and contributing to its sustainable economic and social development.
MAIN COMPONENTS
PROJECT 1: <u>STRATEGIC PLANNING FOR MONTERREY AND ITS METROPOLITAN AREA (MMA)</u>
This project considers the performance of an exercise for the strategic planning of MMA's development, in which the knowledge city integral strategy is included, and which details in the strategic plan what is needed for its implementation. The intention is to align the development strategies around common objectives, and to have a consensus with the civil society and private initiative on the main goals to achieve. The government (both the state and municipalities of MMA) and the companies should adapt their activities to fit the strategic objectives established in the Plan.
PROJECT 2: <u>METROPOLITAN DEVELOPMENT ADMINISTRATION SYSTEM</u>
To create an integrated system for the administration of strategic areas in metropolitan development, that will improve the efficiency of the integrated state–municipalities of MMA's public action, and to achieve the goals established in the Strategic Plan. This involves integrating, as far as possible, a unique metropolitan police, a single, solid residue – collection system, a single authority for the management of natural resources and protected natural areas, a single urban development planning authority, and a single entity dedicated to the promotion of economic development. Such entities are constituted by professional personnel, and their selection should be made on merit recruitment processes. In the fulfillment of this proposal, the process (phases and stages) recommended should be thoroughly evaluated, so as to make it politically, technically, legally, and economically viable.

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PROJECT 3:
CREATION OF A METROPOLITAN OBSERVATORY

The observatories are tools which have gained a great importance in public policies, due to the valuable information they contribute and which enables the evaluation and guidance of governmental actions, in order to keep the planning focused on strategic goals. Having a metropolitan observatory in MMA would generate very valuable information and indicators, both for governments and for the society as a whole and for the private enterprise.

INF-02

"SUSTAINABLE MOBILITY" PROGRAM

OBJECTIVE

To satisfy the origin–destination journeys (trips) sustainably and competitively with quality in MMA for the future of the citizens, complying with and improving their metropolitan coordination system, the current urban and environmental mobility norms and laws, by applying successful transportation and mobility models from other cities in the world, but adapting them to the lifestyle of the city.

Also, MMA should have an integral mobility system which is intermodal, modern, flexible and attractive, where the traffic design favors public transportation, enabling the interconnection of the entire metropolis in an efficient and rational way. With these advantages, the community will express their preference toward using public transportation over the car, which encourages a controlled growth of the number of vehicles.

MAIN COMPONENTS

PROGRAM 1:
INTEGRATED AND SUSTAINABLE PUBLIC METROPOLITAN
TRANSPORTATION SYSTEM

- To have an avant-garde public transportation system, worthy of a Knowledge City, this is a viable alternative to the use of private transportation. To design and strengthen a unique scheme of metropolitan coordination that carries out the planning, management, and control of the metropolitan public transportation (the case of Santiago in Chile is very appropriate for study and consideration); that operates efficiently with a mix of public and private resources, and mixed operation (with a compensation chamber) to enable an efficient mix of different kinds of transportation, giving priority to articulated transportation systems (Bus Rapid Transit/BRT), subway and modern buses, and to achieve a multimodal operation scheme.
- To restructure the current operators and concessions system, with a new

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system based on the public – private association between contractors and state government.

- To redesign transportation routes based on an origin–destination poll.

PROJECT 1:

METROPOLITAN NETWORK OF FOOTPATHS AND CYCLE PATHS

To enable ecological, healthy, safe, and practical alternatives for transfer over short distances within MMA.

PROJECT 2:

TRAFFIC INFRASTRUCTURE PLAN TO SUPPORT SUSTAINABLE MOBILITY

To plan, design, create, and restructure traffic infrastructure according to the urban mobility model desired for the city, based on successful experiences in other cities worldwide and having a main focus on public transportation, thus guaranteeing and facilitating its safe and fast access, and contributing to an optimal origin–destination journey.

- An evaluation of the implementation of traffic complexes such as Venustiano Carranza and Ruiz Cortines and the East habilitation to Ruiz Cortines and Bernardo Reyes is required. These complexes will enable the adequate connection between Venustiano Carranza and the *Anillo Vial Metropolitano*.
- Moreover, once the enlargement and connection of Venustiano Carranza is completed, it will become a very important metropolitan avenue, because it will work as an urban motorway supporting the Gonzalitos Av., and connecting the Valle Oriente zone with Rangel Frías (metropolitan beltway).
- The City of Monterrey can then have three motorways for traffic relief: Venustiano Carranza, *Anillo Vial Metropolitano*, and Gonzalitos Av.

PROJECT 3:

TO DISCOURAGE THE USE OF AUTOMOBILES

The areas subject to intense traffic generate a larger amount of pollution. Controlling traffic based on economic measures may generate larger income for road work and it is an opportunity to explore. It is of vital importance to reduce the traffic jams that Monterrey’s metropolis suffers nowadays, by considering the implementation of several measures, within which we can find the following:

- The establishment of entrance time–tables for schools and work that are spread out at intervals.
- The implementation of a program for carpooling between co-workers and classmates, so that cars can transport an average of 2.5 people by “carpooling”, and not the current average of 1.26 people per car which is what happens in MMA.

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- The establishment of reversible traffic lanes.
- The separation of exclusive lines for public or special transportation.
- The application of differential fees in parking lots.
- The improvement of traveling times for the inhabitants of MMA, to decrease the environmental impact of transportation, and to increase the road safety for the inhabitants.

INF-03

“NEW URBAN COEXISTENCE” PROGRAM AND PROJECT PROPOSAL

OBJECTIVE

To guarantee the inhabitants of MMA have access to a dignified living: mixed, well-equipped neighborhoods, with recreation and coexistence areas, in the proximity of their workplaces or schools. To reinvent the city through innovative, humane, and competitive urban policies. Urban Development Strategic Projects Coordination in NUEVO LEON.

MAIN COMPONENTS

PROGRAM 1:

PROMOTION OF INTEGRAL URBAN SUBCENTERS

- PROJECT 1: CREATION OF INTEGRAL URBAN SUBCENTERS IN EACH MUNICIPALITY OF MMA

To guarantee for all the citizens of MMA a simple and quick access to quality equipment and infrastructure, in the proximity of their homes or workplaces.

The under-intensive use of the land, as well as the priority for “uni-use” (zoning as a planning instrument, with a rigid and normative vision) is having disastrous consequences in MMA (and other Mexican cities). Because of this, it is urgent to support a greater residential density, and flexibility in the use of the land, which can coexist in adequately if the planning and construction of infrastructure is handled correctly. A large part of MMA’s population, which is not favored by living in the central and well-equipped suburban areas, has to travel long distances for their daily activities, which in turn has caused an increase in traffic and pollution, an increase in stress, loss of productivity, and in general, to the worsening of the quality and conditions of life for a large part of the population.

Each municipality should seek the creation of integrally equipped urban districts / subcenters, with similar conditions along and across the metropolis. These centers constitute alternatives to the traditional equipment centers, as the downtown area of Monterrey has experienced. The goal for each urban

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subcenter is to have: equipped educational centers, nurseries, senior citizens services, parks, plazas or gardens, and make them accessible by public transportation, walking, or biking.

The proposal is to evaluate the development of regeneration and urban re-densification projects, specifically:

- In Monterrey: the downtown area of the City, the areas of Cumbres, La Alianza, Contry, San Jerónimo, as urban subcenters.
- In San Nicolás: the old town area
- In Guadalupe: the old town area, La Pastora-Contry zone
- In San Pedro Garza García: the Centrito Valle, Valle Oriente.
- In Santa Catarina: the old town area, La Fama sector
- In Apodaca: the old town area, the airport, Nuevo Repueblo - Mezquital zone
- In Escobedo: the old town area
- In García: the old town area
- In Juárez: the old town area

- **PROJECT 2: STRENGTHENING OF THE UNIVERSITY CENTERS AS INTEGRAL, ECOLOGICAL, AND PEDESTRIAN DISTRICTS FOR SOCIAL INTERACTION**

To have university districts which are attractive at a national level, inter-communicated, that can offer students a quality of life and an urban environment that meet international standards.

- **PROJECT 3: STRENGTHENING OF MMA'S DISTRICTS AS AREAS OF COEXISTENCE AND INDIVIDUAL AND FAMILY DEVELOPMENT**

To guarantee every citizen the access to jobs, recreation, services, equipment, and infrastructure, at a reasonable proximity to their homes.

PROGRAM 2:

SOCIAL INTEGRATION THROUGH URBAN DESIGN AND IMAGE

To design a friendly and accessible city that allows all of its inhabitants to have a dignified living.

PROGRAM 3:

DEVELOPMENT OF URBAN CULTURE

The intention is to improve the citizen's attitudes through the implementation of urban culture campaigns focused on the main coexistence problems which are

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observed in MMA, to make them participate in their own development, and to make them aware of the need to collaborate as a group to achieve the goals of the Knowledge City.

INF-04

"SUSTAINABLE AND HEALTHY CITY" PROGRAM AND PROJECT PROPOSALS

OBJECTIVE

To guarantee a healthy and sustainable urban environment for all the citizens in MMA and, at the same time, to preserve the natural resources as a collective good for future generations. The protection of natural resources, the strategic planning for their use, and the care for the ecosystems in which the inhabitants of the city develop, are one of the four pillars for the sustainable development that MMA aspires to achieve by 2025.

MAIN COMPONENTS

**PROGRAM 1:
THE FIGHT AGAINST POLLUTION**

- PROJECT 1: TRASH RECYCLING

To be the most efficient integral system of solid residues collection and treatment in Latin America. To prolong the useful life of landfills, to improve and increase the production of energy based on trash, and to generate additional resources for the operation of the same solid residue collection system.

- PROJECT 2: INDUSTRIAL RECYCLING

To promote the safe recycling of 100% of industrial residues by certified companies, thus reducing environment polluting by enterprises in the area. To support research, outreach and promotion of the best environmentally, technologically and economically viable technologies at an international level.

- PROJECT 3: CONTROL OF POLLUTING VEHICLES AND ENTERPRISES

For MMA to have the best air quality among all larger metropolitan areas in Mexico, enabling the improvement of its inhabitants' health.

- PROJECT 4: REDUCTION OF POLLUTED URBAN LANDS

To reduce the amount of polluted and unused lands, and to make use of their central location to create integral projects for the urban regeneration and bio-remediation, which enables the access to housing, clean industries or services with a central location and better equipment.

- PROJECT 5: INTEGRATION OF A UNIQUE METROPOLITAN SOLID

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RESIDUE COLLECTION SYSTEM

To have a solid residue collection service operated by only one metropolitan enterprise, with excellent and unified services and quality, and unique policies for the selective collection of residues.

PROGRAM 2:

SAVING AND CARING FOR NATURAL RESOURCES

- PROJECT 1: REFORESTATION AND CARE FOR MMA'S URBAN SPACES

To have the largest number of trees per inhabitant amongst metropolitan areas with the same natural and land conditions as MMA, in Mexico, and thus to contribute to a healthier, fresher urban environment, which is ecologically healthy, and with a landscape which improves the appreciation and mood in citizens and visitors. To reduce erosion that contributes to air pollution and recurrent flooding of MMA.

- PROJECT 2: INTEGRAL MASTER PLAN FOR WATER PROTECTION AND ITS SUSTAINABLE USE

All the water-bearings of MMA and NUEVO LEON are integrally managed, with the citizen participation, and guarantee the supply of pollution-free water for the metropolis. The population and economical growth is anticipated to take measures in the saving and better management of this resource in order to guarantee sustainability.

- PROJECT 3: PROTECTION AND SUSTAINABLE MANAGEMENT OF NATURAL PRESERVES.

To guarantee a better quality of life in the metropolis thanks to the protection of the natural environment, and to secure the environmental equilibrium of NUEVO LEON for the future generations. To seize the opportunities offered by these natural reserves for recreational activities related to ecotourism, adventure tourism and rural activities.

PROGRAM 3:

SPACES OF COEXISTENCE METROPOLITAN NETWORK

- PROJECT 1: CREATION OF PARKS, GARDENS, AND PLAZAS ACCESSIBLE TO EVERY DISTRICT IN MMA

To allow every citizen in MMA to enjoy a pleasant, safe, accessible and healthy space for individual and family recreation, close to their homes and workplaces (10 minute walk).

- PROJECT 2: TO STRENGTHEN THE SPORTS CENTERS NETWORK IN ALL MMA

To encourage the practice of sports amongst all the inhabitants of MMA, with options for all ages, and close to their workplaces and homes, by having public

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access to sporting infrastructure aplenty, both in number and quality.

INF-05

“URBAN IDENTITY AND IMAGE” PROGRAM AND PROJECT PROPOSALS

OBJECTIVE

To strengthen the identity of Monterrey and its metropolitan area (MMA) so the city may achieve national and international fame due to a well cared for image, its resources and variety of options, and its available cultural and recreational infrastructure, focused on Monterrey’s characteristic customs, as well as Mexico’s, which are attractive both to residents and national or foreign visitors. Taking advantage of the proximity to the USA, to try to increase not only business tourism, but also recreational tourism, and that of events and conventions, seeking to offer more alternatives linked to regional or national Mexican culture and folklore.

MAIN COMPONENTS

PROGRAM 1:
HISTORICAL, CULTURAL, AND NATURAL RESOURCES PROTECTION

To have a reinforced urban image and identity by 2025, that can be known at an international level for its own symbols.

URBAN PROJECTS WITH METROPOLITAN SCOPE.

- To create new theme parks focused on local and national Mexican traditions and folklore. (See Appendix attached to this deliverable).
- To promote and encourage private investment in new recreational theme parks that offer new options for the recreation of residents and national or foreign visitors, and which emphasize Mexico’s and NUEVO LEON’s traditions: culinary, artistic, handicrafts, etc. These parks should be internationally emblematic state projects.
- To create an artistic and creative center in *Parque Fundidora* and Monterrey’s First Square.
- To have a national vanguard center for artistic creation and knowledge intensive services.
- To try to be the seat of new international events with a favorable socio-economic evaluation, with adequate participation commitments from the state and municipal governments, and private enterprise.

To continue MMA’s urban rehabilitation, and promote the metropolis, both nationally and internationally, enabling the arrival of more visitors.

INF-06

**“EQUIPMENT AND REGIONAL AND URBAN INFRASTRUCTURES FOR
MIKC” PROGRAM AND PROJECT PROPOSALS**

OBJECTIVE

To improve NUEVO LEON's infrastructure and especially that of MMA, so that its insertion into the global economy and the commerce and knowledge networks be strengthened within the MIKC Program, in order to maintain the local economy's levels of competitiveness and be open to new business related to knowledge industries and sectors that the program seeks to promote. All of the above will boost the NUEVO LEON and MMA's economic and social development.

MAIN COMPONENTS

PROJECT 1:

TELECOMMUNICATIONS ACCESIBLE TO ALL

To enable the access to new digital technologies for the largest possible number of inhabitants of both MMA and NUEVO LEON, guaranteeing their expertise in and the handling of said technologies; such measure will render a society better prepared to face the challenges and reap the benefits of a knowledge based economy.

PROJECT 2:

INTEGRAL MULTIMODE LOGISTICS FOR REGIONAL TRANSPORTATION

To count on an inter-mode terminal with a strategic placement for consolidation and distribution for both cargo and passengers, which will allow to efficiently transfer or switch between the various modes of transportation concentrated here, making it considerably more expedite to move by offering a better support for enterprises using this node to have swifter and more efficient distribution for their products, services, consultancy and intellectual capital. To fill the role of a logistics centre and motor for Nuevo Leon's economic development, offering the most modern infrastructure that allows the connection between the different modes of transportation —automotive, railroad, air and sea transportation—backed by the most sophisticated and competitive telecommunication, materials' handling and support services systems. To constitute a new pole for development within the state, thanks to the integral planning of activities and uses, and the adequate blending of public and private resources.

PROJECT 3:

**BOOST THE PROMOTION FOR CREATING A HOSPITAL AND HEALTH
SERVICES HUB IN NUEVO LEON**

To be the city with the best medical care and equipment in Latin America,

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contributing to having the best cared-for population in the country, and to be a medical center with high quality standards and competitive prices, in the private specialty services sector, that allows Monterrey's medical care services and health sciences cluster represent a larger percentage of the state's employment and GDP indexes, and that gains global recognition for its great innovations in medical issues.

PROJECT 4:

PROMOTION FOR THE CREATION OF NEW KNOWLEDGE-BASED SCIENTIFIC AND TECHNOLOGICAL PARKS

Scientific and Technological Parks are nuclei of the regions' technological and economic dynamism; they boost the industrial sector's goals and support functions, such as the generation of scientific and technological knowledge, the establishment of industrial activities and high-quality knowledge-intensive services, that promote the application and experimentation of new technologies and innovations; finally, the establishment of technological and training service structures aimed at manufacturing enterprises and institutions, a reason why it is highly advised to set the promotion of new technology and science parks as a priority, and preferably with private funding, yet supported by state, federal and municipal government incentives.

As with the currently existing PIIT, this project's objectives are: to link research and innovation from the academic sector to enable technological transfer to the productive sector in Nuevo Leon, attract international technology-based enterprises, create new high-value jobs for Nuevo Leon, incubate and accelerate businesses oriented towards new technologies and promote economic development through the commercialization of new technologies, and firmly based on the promotion of mid-high and high technology industrial activities, and of knowledge-intensive services (according to the OECD classification).

INF-07

"HIGH PERFORMANCE COMPUTER CENTER"

OBJECTIVE

Complementing the in-process NUEVO LEON Digital's project implementation, we propose to promote the creation of a "High Performance Computer Center in Nuevo Leon" through an alliance between federal, state and municipal governments, and the business and academic sectors.

The center would allow owning a robust infrastructure supporting R+D mega-projects for public and private universities, as well as for the productive sector to carry out complex R+D e innovation projects. It would also be beneficial if it supported the Integral Information and Intelligence Center of Nuevo Leon (*SI³NL*), proposed in Phase 2 of the MIKC Program, as well as offering support

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for computer science research to the strategies and actions in prevention and public safety and to the models and calculations related to the efficiency of mobility in MMA, among other services.

MAIN COMPONENTS

- To create the Nuevo Leon Supercomputing State Center, be it through the acquisition of a supercomputer or the creation of a virtual grid that integrates the available computing resources thought the territory.
- To incorporate the Nuevo Leon Supercomputing State Center to the Latin American Grid (LA Grid)⁹.
- To support the creation of the National Supercomputing System, non-existent in Mexico to this date, through institutions interested in the development of research in this field and the creation of a national supercomputing virtual grid.
- To incorporate the Mexican society, but especially that of Nuevo Leon, to the support for various research projects that require vast amounts of data processing through a state project such as the University of California, Berkeley's open-source software for volunteer computing and grid computing¹⁰.

MEASUREMENT INDICATORS

- Investment amount achieved for the project (public, private and institutional).
- Number of institutions using the resources of the Nuevo Leon Supercomputing State Center.
- Number of projects, and their added value, which are being supported by the Nuevo Leon Supercomputing State Center.
- Number of success stories achieved thanks to the intensive numeric computing services offered by the Nuevo Leon Supercomputing State Center. The intellectual property that it backs up and its derived value.

INF-08

"COMPUTER AND INTERNET FOR ALL" PROGRAM

OBJECTIVE

To make Internet access and computer equipment available to the largest number of schools (public and private), enterprises (especially S&MSEs), and homes in MMA because of its great advantages as enablers to actively facilitate and accelerate evolution towards a true knowledge-based society; to set up areas where Internet access is free of charge within the most important public areas and achieving a high coverage of information systems networks in the majority of MMA and at competitive prices when compared to international standards, fostering the capitalization of the advantages that the ICT's offer, thus

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improving the quality of life in all society's socio-economic strata.

MAIN COMPONENTS

To reinforce the important advancements achieved through the NUEVO LEON Digital and other projects and strategies, both public and private; it is recommended to complement the initiatives of connectivity and access to computers through the following steps:

- Increase the investment budget of NUEVO LEON's Government and that of the municipalities in MMA in the items concerning the broadening of the investment in broadband infrastructure, to offer a wide area coverage by telecommunication networks across the region, including WiMax infrastructure, in order to offer free connectivity in public areas additional to those already in existence, such as parks, plazas and public schools.
- Set up (digital) "Knowledge Kiosks" that allow the citizen to carry out official procedures required by the Government from public locations, as well as have access to useful information regarding public events related to fairs, expos, cultural endeavours and sporting events, etc.
- Provide web-hosting services that allow for recreation and reunion, that offer information about entertainment and culture, advertising and topics related to MIKC.

About funding:

- Invest an important "seed capital" from NUEVO LEON's Government (it is recommended to begin with a total contribution of \$100 million pesos collected from all investors).
- Design a warranty scheme to multiply part of the "seed capital" and which would be managed via a trust fund created to this end.
- Collect contributions from the private sector, as well as from institutions and foundations that back up ICT's.
- Get financial institutions (commercial banking and NBFIs) involved so they operate as entry level destinations, and they multiply the resources assigned by NUEVO LEON's Government for a Warranty Fund, as much as possible.
- Consider inviting different Federal Government offices (i.e., Ministry of Economy, SEP, and even other institutions such as INFONAVIT), as well as international financial organizations dependent from the Inter American Development Bank (IDB) and the World Bank (WB), to join the project.

MEASUREMENT INDICATORS

- Coverage level in the Access and Penetration rates for ICT's and Internet in schools, households, business (especially SME's) and public places.

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- Ownership level (Internet access contracts and computers).
- Public and private funding of the program and the deployment of free connectivity broadband networks.
- Value of the contributions and donations from the private sector, international financial organizations (IDB, WB, etc.), foundations and others for the improvement of connectivity and computer equipment.
- Polls regarding the benefits that this increase in Internet connectivity and the ICT's generate for the productive sector, and students and teachers from the schools benefiting from the program and at the households on MMA.

INF-09

"BUIDLING MALLS AND POPULAR CULTURE PLAZAS" PROJECT

OBJECTIVE

Due to the problems arising from ambulatory trade in MMA, it is necessary to promote reconversion, rehabilitation and construction of a modern and efficient infrastructure for popular commerce (with a variety of options ranging from food to household items, and some recreational and cultural activities), that through very attractive financing programs, motivate street vendors to relocate and improve urban development, sanitation, hygiene, and the adequate legalization of these activities.

This program must become a natural complement for the tourist attractiveness of the "Barrio Antiguo" initiative; *Fundidora* Park; "Paseo Santa Lucía", etc. because these landmarks form a natural nexus for the surrounding commerce and the mall, contributing to the area's business dynamics and, at the same time, to the historic, cultural, culinary, architectonic and heritage reassessment of MMA.

MAIN COMPONENTS

- Promote the building of malls and cultural plazas by state government and related municipal governments, but it would be ideal for the building, rehabilitation and remodelling projects to be carried out by private investors, backed by the three branches of government.
- To take advantage of federal programs such as:
 - o The financing for equipment and public urban image of the *Banco Nacional de Obras and Servicios Publicos S.N.C* (BANOBRAS).
 - o Ministry of Economy programs (SME's and/or FONAES) and some form the Ministry of Social Development for the commercialization of traditional regional products with an adequate marketing operation.
 - o The selling of these spaces to the vendors, seeking financing schemes

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that are similar in timeframes and conditions to those of mortgage loans destined to housing facilities, especially in interest rates that are competitive and motivate the vendor to acquire a personal asset. The financing schemes may be implemented through a warranty fund with contributions from the federal, state and municipal governments; the Ministry of Economy through the SME's Fund; and the funding from BANOBRAS. A part of the FEGRAM resources may also be used as a warranty fund (making all appropriate legal modifications).

- It is recommended that the indispensable requirements for the sale, financing (with the warranty program's backing) and the granting of the corresponding license to very small business, to promote and enforce the serious nature of the endeavour, be:
 - o The Small Taxpayer Registry (REPECOS).
 - o The Family Workshops Program Registration (Presidential Decree January/2006) that allows family micro enterprises with up to 4 external collaborator "pupils" to be registered to the Popular Social Security Service, and not be forced to pay national insurance to the *Instituto Mexicano del Seguro Social (IMSS)*.

MEASUREMENT INDICATORS

- Square metres of popular commercial and services infrastructure: new buildings, of rehabilitated establishments.
- % of sales and/or occupation.
- Number of beneficiaries and their profiles, seeking a balanced support for gender equity, including a percentage of widows, single moms, people with different abilities, etc.
- Number of registered vendors under the REPECOS regime and the Family Workshop Program (Presidential Decree January/2006) in the state of NUEVO LEON.

ADDENDUM-INF-01

**APPENDIX I: PROMOTE THE BUILDING OF MORE ENTERTAINMENT
THEME PARKS IN MMA**

The economic, social, cultural and theme park importance has raised the cities' interest into offering attractive establishments, with the latest in entertainment innovations for all ages, safe and highly certified, to position themselves as cities with world-class attractions. The Knowledge cities must be entertaining and a way to achieve this is to thematize establishments.

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To this day, in MIKC there is an adequate recreational infrastructure, though too limited to be sufficiently attractive not only for luring a larger number of regional, national or international tourists; but for them to consolidate into an important factor for the improvement of the quality of life in MMA, to attract and retain local, national and foreign human talent.

Among the first projects worth considering for the MIKC Program, we find:

- The Mexican Folklore Park: where with each of the state governments' and private sponsors' participation, national and international tourism may come into contact with the art (painting, sculpture, etc.), culture, cuisine, handicrafts (with craftsmen working on and selling their products), regional dances, clothing, etc. from each of the Mexican states at one single place,
- A park in the style of "TECNOVITAE": one which has its thematic axis firmly based on the use and transformation of Science and Technology in the society's every day life; that links the commonly-used manufactured products to how science and technology can display its production and manufacturing processes by explaining the implicit mathematical, physical and chemical concepts. In a similar fashion, the R+D applications for the monitoring, effects and prevention of the phenomena caused by the actions of man over Nature: pollution, climatic change, erosion, water shortage, use of non-renewable energies, etc., can be also displayed.

Among the success factors to consider, we have the large involvement by the private enterprise and the different sectors linked to the MIKC program, the amount of funding that is achieved with the building of the proposed theme parks, the increase in the attractions available to the local residents, and the objective of giving the visitor a unique national and Latin American experience which is attractive enough for international visitors, including those from North America, Europe and Asia.

Goals:

By 2015: to have 1 new theme park with international appeal, at least, and 4 parks with a regional and/or national appeal.

Resources:

Private, with state and municipal incentives. An estimated private investment totalling \$1,500 million pesos is necessary, so the projects have the desired impact, and state and municipal incentives in the vicinity of \$50 million pesos so the private investment develop one park (at least) with an international appeal.

ADDENDUM -INF-02

APPENDIX II: PROJECTS TO BE PROMOTED PROPOSAL: "PASEO SANTA LUCIA" PROJECT, 2nd PHASE

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In the *Paseo Santa Lucia* Project, there's serious consideration to promote private investment in 29.65 new acres of territorial preserve for the second phase.

It is very important to reinforce the knowledge society by taking advantage of the *Paseo Santa Lucia* project's previous achievements, which sets a perfect platform. To do so, it is recommended that during the 2nd Phase of this project, special attention be given to including the following within its application polygon:

- Establishments for small and medium enterprises related to culture and the arts.
- Options for local entrepreneurs to present innovative proposals in some of the services segment such as: Restaurants, Board and Lodging, and Recreational Activities.

These actions incentivate cultural and artistic enterprises, plus adequately balancing the amount of enterprise sizes and lines of business, making it possible to avoid saturation of Santa Lucia with only large restaurant chains, both national and international, that in some instances do not have the same motivation to support the type of environment and quality of service that the local businessmen/women may have.

ADDENDUM -INF-03

**APPENDIX III: LEGAL OPINION ON THE PUBLIC POLICY PROPOSALS
AND THE INITIATIVE FOR MODIFICATION OF THE URBAN DEVELOPMENT
LAW IN THE STATE OF NUEVO LEON (Dr. Carlos A. Gabaurdi)**

CONSTITUTIONAL AND LEGAL CONSISTENCY OF PUBLIC POLICY PROPOSALS AND THE INITIATIVE FOR MODIFICATION OF THE URBAN DEVELOPMENT LEGISLATION.

"After having read and revised the documentation regarding the proposals for infrastructure and the initiative for modification of the Urban Development Law,¹ as well as the current legal frame regarding human settlements and urban development, it is possible for me to determine that –in principle– none of the public policy proposals is inconsistent with the principles stated in the Federal Constitution, nor with those in the Constitution of the State of Nuevo Leon."

"However, it seems to me that the specific proposal mentioned in the project for the creation of a "Metropolitan Development Administration System" and that

¹ For the appraisal of this document, the following texts, produced within the master plan for the second phase of the Monterrey: International City of Knowledge Program were studied: Reforma Institucional: "Por un Mejor Desarrollo Metropolitano" (INF-02); Programa and Propuesta de proyectos: "Nueva Convivencia Urbana" (Clave: INF-05), and Propuesta de modificación a la Legislación en Materia de Desarrollo Urbano para el Estado de Nuevo Leon correspondiente al mes de agosto del 2007.

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refers to integrating, as much as possible, a single metropolitan police department, a single residue collection system, a single authority for the management of natural resources and natural preserves, a single authority for urban development planning and one office dedicated to the promotion of the economic development, may turn out to be non viable in constitutional terms.² In other words, for this proposal to be viable it would be necessary to conform it to constitutional strictures.”

CONCLUSIONS

- The implementation of a program such as Monterrey, International Knowledge City will require commitment on the part of the State Government, not only at the initial or launching phase, but also regarding the long-term sustainability possibilities.
- In the specific case of the Urban Development Law and the corresponding public policies, it is necessary to make, at least, two significant modifications.
- The first one consists precisely in defining the responsibilities and scope of action for the municipalities, making it very clear that their actions are subordinate to what is stated in the state laws.
- Regarding this point, great care is to be taken so as not to go to the extreme of violating the municipal sphere of competence.
- The second modification refers to the autonomy of the Urban Development State Agency; as with its present nature we are dealing with an organization that is totally dependent and subordinate to the executive branch; a situation that leaves its actions irrevocably linked to the current governor's good will, making the long term sustainability quite improbable.
- On the other hand, the successful implementation of an adequate legal frame in this matter, requires that aside from the modifications to the Urban Development Law, modifications be made to other laws (i.e.: the civil and penal codes), and that other new laws and regulations be enacted to allow the viability of the program (i.e.: reference laws regarding the exercise of municipal roles, municipal regulations, judicial instruments for jointly-urbanized actions, etc.).
- In the same vein, we consider that the plans for urban development must be raised to the category of law initiatives approved by the State's Congress, for it is the only way in which these can transcend a six-year period, as well as force the municipal authorities to comply.
- Not enforcing the law is frequently signalled as the reason why a certain judicial

² In the terms of the current legislation this could happen because of the following reasons (among many others): (a) the State assumes powers that correspond to the municipalities, invading the sphere of competence these have; or (b) and intermunicipal authority is created with no clear level, between state and municipal authorities.

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frame does not work, but normally this is an erroneous perception.

- For the dispositions and instrumentation regulations contemplated in a certain judicial frame to work, it is necessary to take each and every one of the material measures to ensure the implementation of said judicial frame. Added to the fact that said measures must also count on the legal backing that supports them.
- Another point that is constantly mentioned is the one referring to corruption, but beyond the activities directly implemented to fight it, it must also be said that a judicial framework that is absurd, irrational, impossible to abide to, or too rigid is fertile ground for corrupt actions.
- Before that which is absurd, irrational, impossible to abide to, or extremely rigid, the alternate escape ways with the collaboration of those inside appear with unsurprising ease.
- Mexico has now entered a time when transparency and the civil society's participation appear to be the order of the day.
- Finally, it must be added that an important difference among the other knowledge cities lies in the fact that none of them has the social and economic disparities that we have, and we must add the constant hopelessness in the economic environment and the possibilities for advancement.
- Any solution as important and significant as the proposals in this program must necessarily be visualized holistically.

4.1.5 Strong Institutions.

To promote a knowledge city or region, the participation of public, private, social and mixed institutions becomes fundamental. These institutions support the efficient and successful building and implementation of strategies, public policies, programs and projects that foster and differentiate a city or region in their knowledge-based development. Nevertheless, these must count on human resources with adequate capabilities, abilities and aptitudes, as well as with the sufficient budgetary resources to be able to achieve their goals and objectives.

To strengthen the development of Monterrey, International Knowledge City Phase 2, we propose **reinforcing and, in other cases, creating public, private, and mixed institutions to back up the implementation process of MIKC proposals.** The institutions' proposals are overwhelmingly linked to information systems, financing systems, education grants and efficient use of energies, addiction prevention and control, among others. Considering the advancements of Phase 1, as well as our own recommendations derived from the present work, and trying to reinforce and boost the MIKC process, the following are proposed. For more detailed information, see Appendix II: Details

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on MIKC proposals and master plan for Phase 2: public policies, programs, projects, institutions and resource investment.

INS-01

CREATION OF THE "INTEGRAL INFORMATION AND INTELLIGENCE SYSTEM OF NL" (Si³NL)

OBJECTIVE

We consider strategic for the MIKC Program Phase 2, the evolution of Data Nuevo Leon, which currently has a very limited structure and resources, to transform it into the Integral Information and Intelligence System of NL (Si³NL), as a decentralized public organization (DPO), with its own legal identity and assets; with a mixed governing board in which state government officials, representatives from entrepreneurial organizations, leading universities, unions, the mayors of the municipalities conforming MMA, and some representatives from the organized civil society, can participate.

The Si³NUEVO LEON involves the design and implementation of a powerful technological platform for the creation, compilation, integration, administration, validation, analysis and diffusion of quantitative and qualitative information, with the purpose of facilitating the process of mental synthesis and that this efficiently direct the public and private decision-making process through multidimensional and dynamic on-line statistical information systems, and consulting and advising according to the user's needs (customized consulting).

MAIN COMPONENTS

The Si³NUEVO LEON must guarantee the availability of information with the quality, periodicity, opportunity and reliability parameters that are called for in a knowledge-based economy. It is essential that in the short term (2008-2010), the Si³NUEVO LEON be designed and set into operation under the following recommendations:

- To be a transverse organization in its operation and influence areas, that is, for it to integrate and transmit every kind of useful and necessary information for the economic and social development of NUEVO LEON.
- To count on a reasonably significant budget for: infrastructure, adequate facilities and equipment (especially on IT's) and the creation of a website with a technological platform adequate for data collection, management and transmission (voice and video inclusive).
- Development and implementation of a Dynamic-Multidimensional-Multilayered Statistical System (online), that allows consultation, exploration, interaction, analysis and information-sharing.

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- Integration of a Business Intelligence System or Unit (online) that efficiently administers dynamic reports and facilitates the reading, interpretation and follow-up of data and indicators.
- To boost geo-spatial information systems through the creation of a Geo-Referenced Information Coordination (CIGR) for the strategic planning and development of the Knowledge city.
- Development of a Specialized Consultancy or Advisory Unit for Information and Intelligence.
- A periodic publication related to Public Administration and Management.
- To have access to a larger number of databases by signing of inter-institutional information collaboration and exchange agreements.
- To be self-supporting in the mid term, striving to achieve a certain budgetary autonomy, by charging symbolic fees in exchange for services offered to information users.
- To design and perfect an Interactive Municipal Information System.
- Active participation in the National Geographic Information and Statistics Development Program (PRONADEIG), as well as National Information and Statistics Commission of the Mexican Association of Economic Development Ministers (AMSDE).

Priority Level: High

Resources and Time Frame:

2008-2009 very important to carry out the implementation.

The initial infrastructure investment (renting adequate facilities, or acquiring existing ones) estimated to be \$50.0 million pesos.

A yearly budget for its operation of \$30.0 million pesos, at least, with the suggestion that it operate with a slim structure, but with human resources of high technical and professional levels.

It can be estimated that on the 3rd year of its operation, it may obtain up to 10% revenue that allows it to begin a financial self-sustainable scheme, looking for a growth rate of 5% per year, until reaching a 50% of externally-generated resources for its operation budget.

MEASUREMENT INDICATORS

- The success achieved in the implementation of the Indicators System, its measurement and follow-up, related to the Phase 2 of the master plan for "Monterrey: International Knowledge City".
- Number of monthly queries for documents, databases and all the information

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available at Si³NUEVO LEON.

- Number of consultations and advisory given by the Si³NL staff.
- Service evaluation polls among its users.
- Level of economic self-sustainability achieved.
- Visits and queries on the Si³NL website.

INS-02

CREATION OF THE "NUEVO LEON INTEGRAL FINANCING SYSTEM"

OBJECTIVE

Through the creation of an Integral Financing System for NUEVO LEON, we seek to cover the needs of the MSME's through mechanisms still out of reach for the traditional banking firms. The proposal considers the designing of novel instruments both for the capture of savings, as well as for the allocation of credits for the micro, small and medium enterprises setup in the state with productive projects, for infrastructure, capitalization and development of human capital, among others. All this will increase the offer and availability of a stronger entrepreneurial financing with the ultimate goal of promoting employment generation and the increase of Nuevo Leon State's productive capability, but always trying to give preferential treatment to enterprises within the strategic knowledge-based sector, and those with a higher level of innovation and technology.

MAIN COMPONENTS

The proposal to create the Integral Financing System considers the creation of a private public organization in which, to multiply the initial capital, an evaluation can be made on the subject of obtaining funding by the allocation of bonds with attractive interest rates among small savers, and that thanks to a guarantee by the Government of NUEVO LEON, it would practically eliminate the risk in their investment, this way becoming more viable for the organization to offer more competitive financing to the beneficiaries. Likewise, to ensure that said organization complies to both the candidates and investors' expectations, the operation of Two Warranty Funds is suggested; one specializing in credit for SME's and another for Microcredit.

The program would operate using the same essential mechanism for the National Financing System of the Ministry of Economy "SINAFIN", through the warranty funds. The recommendation is to try to obtain resources totalling \$200 million pesos, at least, from the state and federal governments. By mainly undergoing the warranty scheme, the resource may be multiplied 25 to 30 times, at least, in wide-breadth credits considered through the first financial echelon

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intermediaries in most of cases, but negotiating very attractive conditions for the beneficiaries, by having the Integral Financing System absorb the risk of “first losses” through the proposed Warranty Trust Fund.

For the microcredit system’s operation, we suggest that this program be operated through only one product: “Nuevo Leon Microcredit Card”, a step that eliminates the bureaucratic requisites and structures that make its allocation too costly, substantially reducing the interest rates charge when compared to international standards.

“Entrepreneurial Credit SME’s-NUEVO LEON”

We recommend that the granted credits go from MX\$30,000 (to cover the most basic work capital needs) to MX\$5 million (to finance the buying of machinery and equipment in medium enterprises).

The program would operate using the same essential mechanism of the SINAFIN, through warranty funds. The recommendation is to obtain resources totalling \$200 million pesos, at least, from state and federal governments.

“Nuevo Leon Microcredit Card”

This card will allow individual taxpayers with a small productive activity and local entrepreneurs with micro and small enterprises, to count on a revolving line of credit dedicated to satisfying their micro-financing needs, so they do not have to go through a new administrative process every time they require a loan, making it possible to reduce the answering times and the current exorbitant transactional costs incurred when using traditional credit cards (with interest rates close to 50%), but quite commonly used by entrepreneurs that participate in small productive activities.

MEASUREMENT INDICATORS

- Number of projects supported through the Integral Financing System for NUEVO LEON.
- Economic spillover generated by loans for the projects being backed.
- Number of jobs (including self-employment) generated by the entrepreneurial thrust and the program’s support, as well as the impact in sales and exports of the supported projects.
- Number of trained entrepreneurs.
- Enterprise survival rate for the supported projects.
- Risk portfolio percentage.
- Past-due accounts portfolio percentage.
- Economic self-sufficiency of the Integral Financing System.

INS-03

BOOSTING THE CREATION OF THE "EDUCATIONAL CREDIT INSTITUTE"

OBJECTIVE

To boost NUEVO LEON's government project for creating the "Educational Credit Institute", to support families and people who require financing for their education, in very accessible timeframes and interest rate conditions, so they can count on the necessary economic resources that will enable a better access to technical, higher and postgraduate education. Through the use of a right mix of direct funding from the Federal and State governments, and the implementation of warranty funding schemes supported by government resources, so they can finance resources coming from other more competitive funding sources, but adverse to taking risks (like pension funds or bonds emission) which will make it possible to significantly increase the foreseen resources and impacts.

MAIN COMPONENTS

- Financing through a seed capital granted by the government NUEVO LEON, that can be used as a "Warranty Fund" via a trust fund with public and private participation, allowing to multiply manyfold the resources obtained, using this "Warranty Fund" so the Commercial Bank and Non-Bank Financial Intermediaries (NBFIs) act as granters of the credits at an "entry level".
- Making the Commercial Bank and NBFIs, multiply 10 to 15 times, at least (foreseeing a loss expectancy due to unrecoverables between 6.66% and 10.00 % in the credits granted) as entry level granters.
- Including other organizations with support programs for education projects like the IDB.

Priority level: HIGH

Resources and Timeframe: 2008-2009 very important to carry out its implementation.

The estimated investment for the seed capital and the set up of operations might be \$50 million pesos for the seed capital and \$5 millions to support operations set up for the NUEVO LEON Educational Credit Institute (equipment, renting adequate facilities, or acquiring those already in existence).

A yearly budget of at least \$50 million pesos to increase its capital (and boost financing under the proposed scheme), and \$5 million pesos for its continued operation, with the suggestion that it operate with a slim structure, but with human resources of high technical and professional levels.

MEASUREMENT INDICATORS

- Number of students supported through the NUEVO LEON Educational Credit

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Institute.

- State, federal, institutional and private yearly contributions, both national and international, to the State of Nuevo Leon Educational Credit Institute.
- Total amount of resources operated by the NUEVO LEON Educational Credit Institute and its yearly growth rate.
- Annual credit recuperation percentage.
- Percentage of students with educational credits that graduate (high school and higher education).

INS-04

PROMOTING THE CREATION OF THE "ENERGY EFFICIENCY AGENCY OF NUEVO LEON"

OBJECTIVE

To promote the creation of a local agency to help enterprises and institutional and residential consumers to lower the impact the high cost of energetics is having in Nuevo Leon, through the acquisition of energy efficient technologies. It is expected that this agency have a strong link and alliance with the federal government via the National Energy Saving Commission (CONAE) and the Electric Energy-Saving Trust (FIDE) and the different programs that can back up their work, as well as with international organizations that support and promote the efficient use of energy, due to the enormous benefits regarding competitiveness and the environment.

MAIN COMPONENTS

The energy efficiency agency, as seen in successful initiatives, must cover the primary regional needs with actions such as:

- Researching the best existing practices and technologies throughout the world for every type of user and bring them closer to productive, institutional and private sectors within the state.
- Promoting the adequate technologic R+D projects that allow for the generation of equipment, materials, processes (or their improvement) to promote the efficient use of energy and alternate energy sources.
- Promoting the creation of enterprises in the energy efficiency consulting services sector, or of the manufacturing and distribution of materials, equipment and systems that back up the efficient use of energy in the productive, institutional and private sectors.
- This agency would research, evaluate, negotiate, transmit and promote the best international technologies available and susceptible of being used by the

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main energy users in NUEVO LEON.

- It would also back the execution of proposals by the federal and state governments, and enterprises in the financial sector, to count on the necessary and adequate incentive and financing programs which will enable the users in the different sectors to make the necessary investments to improve their efficient use of energy.
- Maintaining an interaction with national and international organizations that will reinforce its operation.
- It is considered that the best way to organize this agency is through a private organization, operated by the NUEVO LEON's main entrepreneurial organizations interested in the subject, and backed by the State Government and the Federal Government.
- It will be important to consider its implementation through initial government and private contributions ("seed"), and that it seek self-sufficiency through a reasonable remuneration for its services, and possible donations from international organizations that support these initiatives.

Priority Level: High

Resources and Timeframe:

2008-2010 very important to carry out the implementation.

The estimated investment for setting up operations could be \$20 million pesos to back up the agency's launch (equipment, renting adequate facilities, or acquiring existing ones). An important back up is required from the proposed Integral Financing System (for the financing part so companies and users can invest on equipment and items to improve energy efficiency; plus the possible additional funds that the Government of NUEVO LEON might determine (as in the case of what was implemented in Barcelona).

A yearly budget of at least \$5.0 million pesos for its operation, suggesting it operates with a slim structure, but with human resources of high technical and professional levels.

MEASUREMENT INDICATORS

- "Seed capital" contributions from the federal and state governments, and the private sector, to provide enough starting funds.
- Time required for achieving self-sufficiency in the agency's operation.
- Scope of the national and international alliances and their concrete results.
- Improvement and positive impact reported by the users of its services for the improvement of energy efficiency and cost for their operation.
- Results in the industrial, commercial and services enterprises backed by their

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linking and promotion activities.

- Energy market monitoring to compensate for the fluctuating conditions of investments.
- Impact levels regarding the settling of controversies with its associates.

INS-05

ESTABLISHING THE "INTEGRAL BUDGET FOR THE PROMOTION OF MIKC"

OBJECTIVE

To have a control system for projects that require investments and direct expenses by the Government of NUEVO LEON, linked to each of the strategies, programs, goals in the main indicators, etc. for the MIKC program and that may be carried out by the State Treasury, in a coordinated effort with the different areas within the state's government; as well as determine the contributions from the private sector and the municipal governments on MMA. We also consider that once the budget items directly linked to the MIKC program are identified, both by the State Government and by the private sector, a net growth goal as high as possible shall be determined. This will allow boosting the process and achieving results for the planned goals. (For more details on the proposal, see Appendixes II and III).

MAIN COMPONENTS

- The actions initiated during MIKC's phase 1 (2004-2008) have made it possible to set the basis for formulating the master plan proposed for Phase 2 (2009-2025), these being a valuable contribution as a starting point for each one of the main pillars for the development of a Knowledge ciudad/region, and which have been used by Tecnológico de Monterrey's work team to formulate the proposals for the Master Plan Phase 2, and which will be an accelerator for the consolidation of the Monterrey: International Knowledge City Program (MIKC) towards the year 2025.
- The content for each and every one of the proposals determines which the main concepts susceptible to contribution expenditure and investment are. It is recommended that the information offered in our proposal be used to carry out a process of strategic planning coordinated by the State Government and with the active participation of the sectors involved with MIKC, so as to clearly determine the required amount from budget allocation, specific goals and the parties responsible of their implementation.
- Its is of utmost importance that the goals we propose, and that will ultimately be

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determined in the final MIKC Master Plan Phase 2, have a direct link to sufficient economic resources to support its successful implementation, and for its advances and impact to be constantly evaluated. Each office and government area, based on the final goals for each area, linked to MIKC Phase 2, will state its budget proposal, which will allow it to successfully achieve those goals. Likewise, it is recommended to coordinate the goals corresponding to the private sector with those for the universities, other institutions and participating social organizations, in order to have some degree of control over the investments and expenditures being made, as well as the monitoring and evaluations of the advancements and results in the achievement of said goals.

MEASUREMENT INDICATORS

The Measurement System is being used –with the corresponding indicators proposed in the 20 PIKS system- addressed in this chapter, section 4.2.

ADDENDUM-INS-01

APPENDIX I: REINFORCING "ADDICTION CONTROL AND PREVENTION PROGRAMS"

OBJECTIVE

To strengthen institutions both in the public, and private and social sectors—as well as the coordination between them—that are responsible for “addiction control and prevention programs”: a Knowledge Society requires that its individuals have access to a decent quality of life, including a social environment with high security levels. Recent and constant conclusions have led to discovering a high correlation between the levels of insecurity and accident occurrence, and the abuse of alcohol and drugs. Additionally, those addicted will generally see their lives affected (as will their family and friends) in their personal finances, emotional states, work performance and career development. Because of all these factors, it is of top priority to reinforce what NUEVO LEON, the municipalities of MMA, the government, society and the institutions are doing to address this issue.

MAIN COMPONENTS

- Increasing the investment of public resources (federal, state and municipal) to support this program, as nowadays the vast majority of institutions addressing this situation are private, non-profit organizations, which often are noticeably limited in the resources available to them.
- Increasing and adding to the development of both contents and methodologies useful for prevention among the population’s various age groups and social segments.
- Bringing the best methodologies, treatments, and medications to NUEVO

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LEON, in order to back up the control policies for the various types of addictions.

- Evaluating the advancements each actor has achieved (federal, state and municipal governments; educational institutions and NGOs) in the attempt to foster better practices, in general, within NUEVO LEON's society.
- Promoting a possible agreement and commitment with the municipalities of MMA, where a limit to the proliferation of licenses granted for the selling of alcohol is set for zones near schools, and where the higher levels of insecurity and violence are reported.

MEASUREMENTS INDICATORS

- The visible reduction attained throughout the state's territory in alcohol, tobacco and illegal drugs' addiction rates—especially in MMA, where the issue is at its most alarming rate.
- Public, private and socio-institutional investment designated to addiction control and prevention within the state.
- Statistical records for: 1) insecurity and accidents regarding their correlation to 2) alcohol and drug abuse.
- Yearly budgetary resources designated to addiction control and prevention: 1) federal, 2) state, 3) municipal, and 4) other private and institutional contributions.
- Evaluation polls from the program's beneficiaries regarding addiction control and prevention services provided by the different institutions (public and social) within the state.
- Available measurement records regarding municipal operation licenses' control (which also implies expunging), for hazardous spots near schools, work centers, public parks, sites frequented by children and teenagers, all of these reported as places where insecurity and violence levels are among the highest on record.

ADDENDUM-INS-02

APPENDIX II: "FEDERAL PROPOSALS FOR MIKC TO BACK UP, AS WELL AS FOR OTHER CITIES/REGIONS THAT WANT TO FURTHER THEIR DEVELOPMENT BASED ON KNOWLEDGE"

OBJECTIVE

To promote a package consisting of important initiatives and proposals directed to the federal government, the federate congress (senators and representatives), that will allow the "Monterrey International Knowledge City program", as well as other cities in the country that decide to further their integral development based on knowledge, to obtain better results through the completion of important

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initiatives corresponding to the federal branch of government.

MAIN COMPONENTS

FINANCING / BUDGET

- Substantially incrementing the federal budgetary allowances related to furthering: R+D+i; the teaching of mathematics and exact sciences to all educational levels, preferably from elementary through high school (K-12) level.
- Identifying the strategic budgetary concepts that can further the national development of a knowledge-based society and economy, and setting a substantial growth rate (at least 5% over that of inflation), adding assignment incentives to the states that adhere to this development strategy, allocating a “par and phase” tracking system between federal and state/municipal resources.

DECENTRALIZATION PROCESSES

- In regards to a viable responsible decentralization of some CONACYT programs—that is, in those states capable of doing so—, especially in the issues such as: SCHOLARSHIPS (each state has a better capability to ascertain its needs, besides the added leverage for the increased promotion of the national postgraduate studies and the avoidance of a growing brain drain; increased determination in those projects to be supported by sector and mixed funding; a greater influence in the decisions made regarding tax incentives linked to R+D+i; a more decentralized operation for R+D centers currently dependent of CONACYT.
- In regards to the federal SEP authority, it is very important to move forward to a responsible decentralization of technological education, striving to increase its link to the vocational inclinations for each state, and improving its operation’s quality supervising chores.

LEGISLATION

- Promoting a Law for Promoting Investment and Employment in High Technology Sectors, that increases the incentives for national and foreign investment that generates employment in those sectors classified as high technology industries and knowledge-intensive services by the OECD; these could be through “fiscal credits”, so as to be executed through a more convenient scheme for the federal tax authority (the incentive is granted once the benefit has been generated).
- Modifying the necessary laws so the researchers at R+D centers receive a percentage of the benefits generated by the licensing of patents and derived copyrights as an incentive.
- Promoting a Presidential Decree to cancel taxation on supplies not available in

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Mexico and required by some technology-based products.

- Promoting another Presidential Decree to grant incentives —such as a 70% of the IRS levied on the profits generated by the investment of angel capital for high technology projects and enterprises, backed by business incubators and accelerators certified by the Ministry of Economy.

EDUCATION

- Substantially increase the promotion of content creation and use of ITC's in the national education system.
- Carrying out a trial test to support responsible and convenient decentralization in the technical education field.
- Budgetary incentive —by the Federal SEP— to those public universities that increase their student enrolment in programs related to engineering and exact sciences, and where the education quality that is being offered is of a high standard (certified by expert third parties); labelling the resources for the expanding their academic infrastructure in those same areas.

INFRASTRUCTURE

- Implementation of the legal and regulationative aspects, programs y and budgets related to the furthering of deployment and competency in the infrastructure related to telecommunications, and the sustainable competitive mobility of both people and goods.
- Regulation and reorganization of the actions by the CONAVI and INFONAVIT regarding the development of low-interest housing through the promotion of quality regulations in both the type of suburban conglomerates of this type of housing facilities being built, guaranteeing these have the necessary quality infrastructure and equipment sufficient for allowing the inhabitants access to decent garden areas, equipment for sports and entertainment-related activities, infrastructure for the treatment and reuse of water and the absorption of rain water, commercial areas, schools, proximity to work centers (as detailed in the proposals for MIKC Phase 2); as well as regulations for the quality of housing standards; all of the above is recommended to be on a pre-requisite/entry level so the developments receive those credits directly or indirectly (through commercial banking) supported by the Federal government programs.

ECONOMY & MARKET

- Incrementing the investment of resources (directly with CONACYT, as well as with the Ministry of Economy and SAGARPA), related to the yearly application of technological and market prospective and intelligence studies, on products and services of a highly technological content and of an innovative nature, all this with the intention of identifying those national and regional “niches” in which Mexico (and its states) have better chances of success.

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MIGRATION

- Simplifying the procedures at SEGOB's National Institute of Migration, to facilitate the granting of residence (FM3) to foreigners coming to support the R+D+i projects, both at public and private centers, as well as supporting the different activities related to fostering a Knowledge-based society or cities and economy; where teachers, entrepreneurs, artists well-versed in the arts and culture, etc.

INTELLECTUAL PROPERTY

- Considerably strengthening the laws, regulations and structures related to the protection and promotion of intellectual property, regarding patents, trademarks, and copyright. A knowledge-based society and economy requires a greater promotion and better protection of intellectual property rights.
- The latter will require an increase in the budgets assigned for these activities, as well as structures of human resources highly-specialized in these labors, and a greater shared responsibility from the local authorities (states and municipalities) in both aspects (promotion and protection of intellectual property). There also exists a need to grant them increased management autonomy to enable a more efficient operation, protecting them from the perils of political-interests contamination.
- Currently, the IMPI, the operation of which generates benefits derived from the fees for the services it offers, has no independence of action in their reinvestment, which has led to an accumulation of surplus for many years, in "temporary investments", affecting its ability to reinforce its structure with an increased independency for empower and becoming more efficient in its activities dealing with promotion and protection of intellectual property, the very reason why it is recommended to promote a greater management autonomy which, among various achievements, will allow it to reinvest the generated surplus resources in the strengthening of its structure, as well as that of its work in the promotion and protection of intellectual property.

4.2 Measurement of success: indicators, measurement and follow-up system.

20 Prime Indicators for Knowledge Societies (20 PIKS)

Source: ITESM 2008

In ever-increasing numbers, those responsible for the design and execution of public policies focus their efforts and strategies in the implementation or strengthening of the endogenous growth model based on knowledge, on innovation and technology, with the goal of furthering and boosting the economic

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and social development in the different countries, regions and cities though out the world.

Thus, the tracking and measurement of the attributes and characteristics set for the economies and societies based on knowledge represent a strategic area for monitoring the impact of all the actions (governmental and private) that contribute to their strengthening and positioning.

The proposal to quantify the advancements of the “Monterrey: International Knowledge City” program, and for other regions or cities with a methodology that supports its replication (refer to Chapter 5: The MIKC experience in benefit of other cities and regions), is system of measurement, indicators, follow-up and road map which has we have called **20 Prime Indicators for Knowledge Societies (20 PIKS)**.

20 PIKS: Methodology proposed for measuring the advancements of a Knowledge city/region

The **20 PIKS** are a simplified system of indicators that considers some of the **KAM** factors (it has new ones); it seeks higher precision through **a deeper focus through 2 sub-indicators strongly linked to the knowledge, innovation and technology sectors (according to the OECD 2004 classification)**, its application leading to more exact, enabling a higher impact by promoting that strategies, public policies, projects, and other activities linked to knowledge-based development programs result in going from general aspects to more precise approaches.

Therefore, the **20 PIKS** are the basis for quantifying the short, mid and long term goals of the public policies, programs, projects, and actions proposed for MIKC’s Phase 2, and those to be defined at a later date, as well as some of the goals established during Phase 1 of this program.

The general objectives of the **20 PIKS** are:

- To constantly and permanently evaluate the impacts (for the short, mid and long term) the MIKC program’s actions have on the economy and the society of Nuevo Leon.
- To become a referential point in Nuevo Leon’s evolution in the Knowledge economy, region and society.
- To detect the MIKC program’s windows of opportunity, to redirect the strategies implemented or design and apply new public policies, programs and projects so Nuevo Leon may reach, in the shortest term possible, the position, renown, characteristics and values pertaining to a Knowledge city (region).

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- To ascertain that this model's economic and social benefits be reached by the whole population, through the monitoring of 4 integral social indicators.
- To monitor a fundamental aspect so the economic and social development of any region be viable and sustainable in the medium and long term, such as the care and preservation of the environment, through an environment sustainability index.

The **20 PIKS** model, based on the World Bank **KAM** methodology, is divided in 5 areas that are highly representative of Knowledge societies and economies:

- Economy
- Social
- Education
- Information and Communications Technologies

In the following chart, the variables that make up the **20 PIKS** are listed, divided into indicators and *20 sub-indicators (identified by the use of italics)*:

“Monterrey: International Knowledge City” Program
20 Prime Indicators for Knowledge Societies (20 PIKS)

Code	Indicator /Sub-indicator	Measurement Units
Area: Economy		
AEC01	GDP NUEVO LEON	Millions (US \$) / Annual Variation (Δ%)
AEC01.1	<i>GDP NUEVO LEON in Knowledge sectors</i>	<i>Millions (US \$) / Annual Variation (Δ%)</i>
AEC02	GDP Per capita NUEVO LEON	Dollars (US \$) / Annual Variation (Δ%)
AEC03	Goods and Services Exports	Millions (US \$) / Annual Variation (Δ%)
AEC03.1	<i>Exports made by enterprises based in NUEVO LEON</i>	<i>Millions (US \$) / Annual Variation (Δ%)</i>
AEC03.2	<i>High Tech Exports</i>	<i>Millions (US \$) / Annual Variation (Δ%)</i>
AEC03.3	<i>Mid to High Tech Exports</i>	<i>Millions (US \$) / Annual Variation (Δ%)</i>
AEC03.4	<i>High Tech Exports (enterprises based in NUEVO LEON)</i>	<i>Millions (US \$) / Annual Variation (Δ%)</i>
AEC03.5	<i>Mid Tech Exports (enterprises based in NUEVO LEON)</i>	<i>Millions (US \$) / Annual Variation (Δ%)</i>
AEC04	Credits for NUEVO LEON's production sector	Millions (US \$) / Annual Variation (Δ%)
AEC04.1	<i>Credits in Knowledge sectors</i>	<i>Millions (US \$) / Annual Variation (Δ%)</i>

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Code	Indicator /Sub-indicator	Measurement Units
AEC05	Public/private budget for MIKC	Millions (US \$) / Annual Variation (Δ%)
AEC05.1	Public Budget for MIKC	Millions (US \$) / Annual Variation (Δ%)
AEC05.2	Private investment in MIKC	Millions (US \$) / Annual Variation (Δ%)
Area: Social		
ASO01	Social security Salary mean	Actual annual growth (Δ%)
ASO02	Mobility and quality of urban road infrastructure <i>Percentage of the population that <u>does not</u> travel in private vehicles</i>	Percentage of NUEVO LEON population (%)
ASO03	Recreational and cultural infrastructure	mts ² /NUEVO LEON inhabitants
ASO04	<i>Environmental Sustainability Index</i>	Index
Area: Innovation		
ASI01	Direct Foreign Investment (DFI) influx	Millions (US \$) / Annual Variation (Δ%)
ASI01.1	<i>FDI in Knowledge sectors</i>	Millions (US \$) / Annual Variation (Δ%)
ASI02	R+D+i expense	NUEVO LEON's GDP Percentage (%)
ASI02.1	<i>R+D+i expense in strategic sectors</i>	NUEVO LEON's GDP Percentage (%)
ASI03	Availability of seed capital/ and risk capital	Millions (US \$) / Annual Variation (Δ%)
ASI03.1	<i>Risk/seed capital in Knowledge sectors</i>	Millions (US \$) / Annual Variation (Δ%)
ASI04	Patents (registered both by IMPI and USTPO)	New patents per year
ASI04.1	<i>Evaluation of the patents' commercial potential</i>	Millions US \$
ASI04.2	<i>Patents linked to Knowledge sectors</i>	New patents per year
ASI05	Innovative and Technological Enterprises	Number of enterprises / Annual Variation (Δ%)
ASI05.1	<i>Enterprises/Sales/Employment/Utilities</i>	In accordance with each sub-indicator
Area: Education		
AED01	Enrolment in tertiary education	Number of students \$) / Annual Variation (Δ%)
AED01.1	<i>Enrolment in higher technical education</i>	Number of students \$) / Annual Variation (Δ%)
AED01.2	<i>Enrolment in engineering and exact sciences</i>	Number of students \$) / Annual Variation (Δ%)
AED01.3	<i>Enrolment in Knowledge-related majors</i>	Number of students \$) / Annual Variation (Δ%)
AED02	Access to internet in schools	Coverage percentage
AED03	Quality in the teaching of mathematics and sciences	PISA test results
AED04	Brain drain	Rate of return (%)
AED04.1	<i>Talent Retention</i>	Rate of return (%)

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Code	Indicator /Sub-indicator	Measurement Units
AED04.2	National and Foreign talent attraction	Number of people/year
Area: Information and Communications Technologies		
ATI01	Internet Users per each 1,000 inhabitants	Connectivity percentage (%)
ATI02	Extent and use of the Internet in formal business	Connectivity percentage (%)

Source: ITESM

It is of utmost importance to stress that for the design, construction, updating, follow-up and publication of the **20PIKS**, it is necessary as a first step to set in motion the **Integral Information and Intelligence System of Nuevo Leon (SI³NUEVO LEON)**, given that due to its natural functions it is the ideal organization that would be in charge, in coordination with the I²T², of the design, integration, updating, follow-up tasks, as well as emitting a technical proposal from the success indicators and measuring system proposed by Tecnológico de Monterrey for MIKC' Phase 2 (for more details on **SI³NUEVO LEON**, refer to Chapter 4 and Appendix II, Proposals for Strong Institutions, INS01).

2025 Road Map: MIKC's 2025 goals, measured through the 20 PIKS scope

Tecnológico de Monterrey makes a series of forecasts and estimates for the **20 PIKS** in a forecasting exercise and as a road map that Nuevo Leon will follow as a Knowledge-based economy and society, set within the MIKC's framework.

It is important to emphasize that the forecasts and trends for the **20 PIKS**, are estimates made by the Tecnológico de Monterrey's work team in the context of MIKC's Phase 2, therefore making it recommendable to reach a consensus for each one of them, preferably during strategic planning meetings of the State Executive in coordination with government branches, the State's Congress; the Educational Institutions; Nuevo Leon's Business Sector and the rest of the key players that are part and participate in the MIKC Program.

The following chart summarizes the goals proposed by Tecnológico de Monterrey for the **20PIKS** in a 2025 horizon and forecast, and the detailed description of this sub-chapter may be seen in Appendix III: Measurement, indicators and follow-up systems.

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Code	Base data (2007)	End of period data			Yearly Growth Average		
		2010e	2015e	2025e	2009-2010e Δ%	2011-2015e Δ%	2016-2025e Δ%
Area: Economy							
AEC01	68,155.7	79,045.1	110,864.9	239,348.9	5.5	7.0	8.0
AEC01.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
AEC02	20,547	22,224	28,364	50,795	4.0	5.0	6.0
AEC03	20,618.1	25,685.4	38,800.3	97,037.6	7.6	8.6	9.6
AEC03.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
AEC03.2	802.1	1,010.4	1,627.2	6,583.0	8.0	10.0	15.0
AEC03.3	14,113.4	17,289.5	25,403.9	60,140.3	7.0	8.0	9.0
AEC03.4	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
AEC03.5	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
AEC04	20,446.7	25,188.8	39,472.5	118,286.9	7.2	9.4	11.6
AEC04.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
AEC05	n.d.	n.d.	n.d.	n.d.	5.0	7.5	10.0
AEC05.1	394.4	548.4	787.2	2,041.9	5.0	7.5	10.0
AEC05.2	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
Area: Social							
ASO01	236.8	290.1	418.4	903.3	7.0	7.5	8.0
ASO02	2,179,183	2,701,221	3,330,725	4,169,818			
ASO03	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
ASO04	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
Area: Innovation							
ASI01	3,327.1	3,851.5	5,402.0	12,788.4	5.0	7.0	9.0
ASI01.1	1,143.3	1,323.5	2,131.5	8,623.2	5.0	10.0	15.0
ASI02	681.6	1,185.7	2,217.3	7,180.5			
ASI02.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
ASI03		100.0	161.1	651.5		15.0	20.0
ASI03.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
ASI04	30	50	105	305			
ASI04.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
ASI04.2	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
ASI05	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
ASI05.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						

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Code	Base data (2007)	End of period data			Yearly Growth Average		
		2010e	2015e	2025e	2009-2010e Δ%	2011-2015e Δ%	2016-2025e Δ%

Area: Education							
AED01	22,428	25,228	37,069	115,130	4.0	8.0	12.0
AED01.1	1,777	2,055	2,882	6,823	5.0	7.0	9.0
AED01.2	7,859	9,098	14,652	59,276	5.0	10.0	15.0
AED01.3	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
AED02	n.d.	60.0	80.0	100.0			
AED03							
AED03.1	435			563	<i>FiNuevo Leonandia</i>		
AED03.2	455			556	<i>Corea</i>		
AED03.3	432			548	<i>Taipei (China)</i>		
AED04	n.d.	70.0	80.0	100.0			
AED04.1	<i>(n.d.) Indicator that will be developed by Si³NUEVO LEON</i>						
AED04.2	n.d.	100	1,350	6,350	50.0	250.0	500.0

Area: Information and Communication Technologies							
ATI01	n.d.	50.0	60.0	80.0			
ATI02	n.d.	50.0	75.0	100.0			

FIX Exchange rate (BANXICO): \$10.64 (August 2008).

Forecasts made based on economic indicators for August 2008.

4.3 Long-term strategic vision: Road Map to 2025.

By establishing the long term strategic vision for the MIKC Program, that is, the **Road Map to 2025**, it is possible to visualize and determine the recommended start-up, growth and consolidation phases for the proposals that have been elaborated and described in Chapter 4.1.

The objective is to increase the results and impact of the MIKC Program on a short term (2009-2010) and mid term (2011-2015) perspective.

This 2009-2025 Road Map is fully detailed in Appendix III: Road Map Plan 2009-2025.

On the following page (80), we present the link between the initiatives carried out during the MIKC Program Phase 1 and the strategies, programs, projects, actions, etc. proposed for Phase 2 of this program.

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LINK BETWEEN MIKC PROGRAM PHASE1 AND MIKC PROGRAM PHASE 2

MIKC PROGRAM PHASE 1 ADVANCEMENT	MIKC PROGRAM PHASE 2 LINK PROPOSALS
<i>Human Capital Education and Development</i>	
<i>SCIENCE AND TECHNOLOGY</i>	
INNOVEC Initiative	EDC-01, EDC-02, EDC-05, CIE-01
Science and Technology for Children Program	EDC-02, CIE-01
Science and Family Program	EDC-05,
Outreach Workshops	EDC-05,
Science Teaching at the CINVESTAV	EDC-05, CIE-01
Robotics in your School Workshops	EDC-05,CIE-01
<i>INFORMATION AND COMMUNICATION TECHNOLOGIES</i>	
Connectivity and Technology	INF-08, EDC-01
Encyclomedia Program	EDC-01,
Educational Software for the Teaching of Mathematics and Sciences	EDC-02, EDC-03, EDC-04
<i>TEACHING IN A DIFFERENT WAY</i>	
From Memorization to Analysis	CIE-01
Bio-psychosocial Development	CIE-01,EDC-01, EDC-05
<i>EDUCATIONAL EVALUATION</i>	
Individualized Attention for the Student	EDC-01, EDC-06
ENuevo Leonace Intermediate Test	EDC-01, EDC-06
Higher Education and Educational Innovation Institute	EDC-01, EDC-02, EDC-07, EDC-08, APPENDIX-CTC-01,
<i>HIGH SCHOOL AND HIGHER EDUCATION</i>	
Tecnologico de Monterrey	EDC-01, EDC-02, EDC-05, EDC-06, EDC-07, EDC-08, CTC-01, CTC-04, APPENDIX-CTC-01, CIE-01, CIE-05, INS-01, INS-03, INS-05
Universidad Autonoma de Nuevo Leon (UANUEVO LEON)	EDC-01, EDC-02, EDC-05, EDC-06, EDC-07, EDC-08, CTC-01, CTC-04, APPENDIX-CTC-01, CIE-01, CIE-05, INS-01, INS-03, INS-05
State Technology Universities, UTE NUEVO LEON	EDC-01, EDC-02, EDC-05, EDC-06, EDC-07, EDC-08, CTC-01, CTC-04, APPENDIX-CTC-01, CIE-01, CIE-05, INS-01, INS-03, INS-05

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ACADEMIC BODY	
The best academics by contest	EDC-01, EDC-06
College of Scientific and Technologic Programs of the State of Nuevo Leon	EDC-01, EDC-02, EDC-05, EDC-06, EDC-07, EDC-08, CTC-01, CTC-04, APPENDIX-CTC-01, CIE-01, CIE-05, INS-01, INS-03, INS-05
Graduate programs at the CINVESTAV	EDC-01, EDC-02, EDC-05, EDC-06, EDC-07, EDC-08, CTC-01, CTC-04, APPENDIX -CTC-01, CIE-01, CIE-05, INS-01, INS-03, INS-05
Institute of Research, Innovation and Graduate Programs for Education	EDC-01, EDC-02, EDC-05, EDC-06, EDC-07, EDC-08, CTC-01, CTC-04, APPENDIX -CTC-01, CIE-01, CIE-05, INS-01, INS-03, INS-05
CAREER INFORMATION AND VOCATIONAL TRAINING	
“Professionals and technicians required in NUEVO LEON. Trends and perspectives” Research	EDC-01, EDC-07, EDC-08, CIE-05, CTC-01
Educational Options’ Consultation System	EDC-01, EDC-07, EDC-08, CIE-05, CTC-01
WORK COMPETENCES	
Modernization of Technical Education and Training Project (PMETyC)	EDC-08
WorkKeys: Knowledge and Abilities	EDC-07, EDC-08
World Interactive Network (WIN)	EDC-01, EDC-02, EDC-04, EDC-07, EDC-08, CIE-01, INS-01, INF-08
HUMAN TALENT DEVELOPMENT	
Talent Development Institute in Nuevo Leon	CTC-01, EDC-01, EDC-07, EDC-08, CIE-05, INF-05
Expert Research Institute and Professional Training in the Justice Department of NUEVO LEON	NA
COMMUNICATION, CULTURE AND THE ARTS	
Messages and Contents related to the Knowledge City	EDC-05
Culture and Arts	EDC-05, INF-03, INF-05, CTC-03, EDC-02
Science and Technology, Knowledge and Intellectual Capital	
Knowledge Managers: Science and Technology Counsel	CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-03, CIE-04, CIE-05
Universal Forum of Cultures 2007	EDC-01, EDC-05, CTC-01, CTC-02, CTC-03, CIE-01, CIE-05, INF-03, INF-05

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Knowledge-based Development Global Week	CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-03, CIE-04, CIE-05
BioMonterrey. International Congress and Biotechnology Exhibition	CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-03, CIE-04, CIE-05
<i>Innovation and Entrepreneurship Culture</i>	
Creation of the Technological Research and Innovation Park (PIIT)	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03INF-05, INF-06, INS-01, INS-04
Creation and expansion of other Research Centers	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03INF-05, INF-06, INS-01, INS-04
Configuration of Strategic Clusters	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03INF-05, INF-06, INS-01, INS-04
Aerospace Industry Development Center (CEDIA)	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03INF-05, INF-06, INS-01, INS-04
Regional Program for Competitiveness and Innovation	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03INF-05, INF-06, INS-01, INS-04
Instruments for innovating in a "Sec". In Mexico, there is creation, indeed. INVITE Program (Regional Program for Technology Commercialization) MIKC and the Mexican Industrial Property Institute Accelerators and Incubators	CTC-02, CIE-02, CIE-03, CIE-04, CIE-05 CIE-02, CIE-03 CIE-01, CIE-03, CIE-04, INS-02
<i>Urban Infrastructure and Equipment</i>	
<i>INFRASTRUCTURE DESIGNED FOR KNOWLEDGE</i>	
Technological Research and Innovation Park (PIIT)	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03INF-05, INF-06, INS-01, INS-04
<i>URBAN INFRASTRUCTURE</i>	
Aerotecnopolis	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03INF-05, INF-06, INS-01,

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Urban Development Metropolitan Plan Update, considering "integral estate-subcenters " ("Zuazua" pilot)	INS-04
Urban Integration: Macropiazza- Fundidora Park - Santa Lucia River	INF-01, INF-02, INF-06, APPENDIX-INF-03
Regia Metropoli Program	INF-03, INF-06, INF-09, APPENDIX-INF-02 INF-01, INF-02, INF-03, INF-04, INF-05, INF-06, INF-08, INF-09, APPENDIX-INF-01, APPENDIX-INF-02, APPENDIX-INF-03
MOBILITY AND TRANSPORTATION	
Sector Program for Transportation and Motorways MMA	INF-02
Metropolitan Beltways and Radial Traffic System	INF-02
Southeast Motorway	INF-02
Interpuerto Monterrey: a top-notch logistics platform	INF-02, INF-06
Modern infrastructure and fast border-crossing lane	INF-02, INF-06
Bioenergy from waste, unique in Latin America (SIMEPRODE)	INF-04, INS-04
NUEVO LEON Parks and Wildlife	INF-03, INF-04, INF-05, CTC-01
CONNECTIVITY	
NUEVO LEON Digital, free wireless network	EDC-01, INF-08
Strong Institutions	
I2T2Creation	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03, INF-05, INF-06, INS-01, INS-04
Configuration of a citizen council for the MIKC Program development's orientation	ALL ECHELONS: EDC, CTC, CIE, INF, INS
Science and Technology Coordination of Nuevo Leon (COCyTE)	EDC-01, EDC-05, EDC-07, CTC-01, CTC-02, CTC-03, APPENDIX-CTC-01, CIE-01, CIE-02, CIE-05, INF-03, INF-05, INF-06, INS-01, INS-04
Strategic Projects Corporation of NUEVO LEON	EDC-01, EDC-02, CTC-03, CIE-05, INF-01, INF-06, INF-07, INF-09, APPENDIX-INF-01, APPENDIX-INF-02, INS-01, INS-02, INS-03, INS-04
Urban Development Strategic Projects Coordination	INF-01, INF-02, INF-03, INF-04, INF-05, INF-06, INF-08, INF-09, APPENDIX-INF-01, APPENDIX-INF-02
Creation of 30 Citizen Councils	CIE-05

4.4 Continuity: Strengthening society's participation.

From its beginnings, MIKC was conceived with a strong humanistic approach, which means that among its various goals we find economic growth, but one accompanied by issues of social and cultural citizen participation, and of commitment from the whole of the population¹¹.

With the institutionalization of the Triple-Helix conceptual model (described in Chapter 3) the MIKC Program has achieved **important advancements in regards to joint and collaborative work among the three sectors**—public, academic and productive—, and the process of the society's active participation has been reinforced through time, especially through the 30 constituted Citizen Councils, the majority of which have existed since 2004, the year when the MIKC Program was launched.

As a by-product of the interviews with leaders and key actors, as part of the methodology used for the elaboration of the Master Plan proposal for the MIKC Program Phase 2, it was possible to identify that **the work and the progress made during Phase 1 of the MIKC Program are recognized and highly valued** both by leaders in the business sector, as well as by the deans of most of the important universities in the state of Nuevo Leon.

It was also recorded that **the interviewed actors y leaders are very interested in participating more actively and in coordination to boost MIKC's economic and social benefits**, as well as the **curiosity, concern and interest in the MIKC Program's continuity in both mid and long terms**. There is also an **urgent need to broadcast and make more ingrained among the society** both the concept and the benefits that the program offers the community in general and the role it (the society) plays in the development and consolidation of Nuevo Leon as a knowledge-based economy and society.

In order to **strengthen society's participation and motivate its involvement with the MIKC program**, the following actions are being proposed as part of the proposals in this master plan:

- The **active integration and participation of the various municipalities** that make up Monterrey's Metropolitan Area (MMA); as well as the Nuevo Leon State Congress and the Judicial Branch.
- A **more visible "empowering" of the entrepreneur sector, the universities and the society** within the MIKC program's scope.
- The **increased broadcasting and information to the population** regarding the benefits of the program at individual and collective levels, and the importance of their participation in the evolution toward a knowledge society.

Regarding the **joint work among MMA's municipalities**, it is important to **foster a strategy that promotes a political alliance for the Knowledge**

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society, derived from the urgent need to work in an coordinated and collaborative fashion towards the building of synergy between the main actors and those in charge in the public sector, including the Executive Power (both at state and municipal levels), the Legislative and the Judicial Branches.

It becomes highly recommendable to push for a strategic political alliance, an initiative originated at both levels of government (state and municipal), with the Legislative and Judicial Branches of Nuevo Leon, an alliance that invites all MIKC's relevant actors to commit to work and strategic planning sessions at least three times a year, where they jointly go through the progress achieved in the main indicators, strategies, programs, projects, the responsibilities and contributions from each party, etc., linked to the fostering of MIKC. It will have the purpose of revising the proposals and agenda for everyone involved, with the goal of strengthening the process, identified by the main work areas: **Human Capital Education and Development; Innovation and Entrepreneurial Culture; Urban Infrastructure and Equipment, and Institutions;** without losing sight of the economic and social components in each and every one of them.

Much of what the MIKC Program Phase 2 consolidation will strengthen, will depend on the co-responsibility of the different actors in the public sector and their ability to develop an integral vision of their strategies for economic, social, cultural, etc. growth, and that the program becomes enriched by the plural nature of all involved and in an environment filled with proposals for the development of NUEVO LEON and MMA. This must also represent the fostering of adequate public policies (new ones, or updates and reinforcement of those that already exist), and that many of their decisions may be guided by this vision of a collaborative way of working in the best interest of a strong, egalitarian and sustainable development in the state of Nuevo Leon.

As an example, we point out some **other important topics** that, **derived from the interviews with executive and legislative branches' actors, and some of Nuevo Leon's society leaders**, require analysis and possible initiatives to back up the strengthening of the MIKC Program during its Phase 2:

- The **convenience of extending the municipal governments' current periods of office**, in order to avoid that due to their three-year period, their mid and long term planning and execution capabilities be affected (a necessary aspect for a Knowledge City and Society).
- **Promoting that certain responsibilities of the public services granted to the citizenry, be administered by a metropolitan organization**, which would enable more cohesive and efficient supply.
- **Analyzing the convenience of implementing a Professional Civil Service in the state**, so the civil servants at certain levels of responsibility that require a technical and high-demands professional profile, both at municipal and state

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levels, cannot be removed with every arriving administration unless sufficient motives to do so exist, and that there are procedures for the recruiting of a substitute based on professional and not political criteria.

- **Revising and reinforcing the current urban development laws and that which pertains to the promotion of development based on Knowledge**, so they respond in efficiently to the integral objectives of the economic and social development, and the environmental sustainability of Nuevo Leon and MMA, taking care of preserving the necessary balance for it to succeed on the long run.

Promoting and achieving a greater empowerment and participation with shared responsibilities for the business sector, the universities and society in general, in the Monterrey: Knowledge International City Program; this is one of the most important and strategic recommendations, derived from the research performed, to guarantee its continuity and reinforce its results.

One of the recommendations that we must stress again, is that of **including the social component with more strength and presence in MIKC's development**, to ensure that the benefits of the knowledge-based economic development may be accessible to the different socio-economic strata and that the social inclusion and mobility to strengthen it exists.

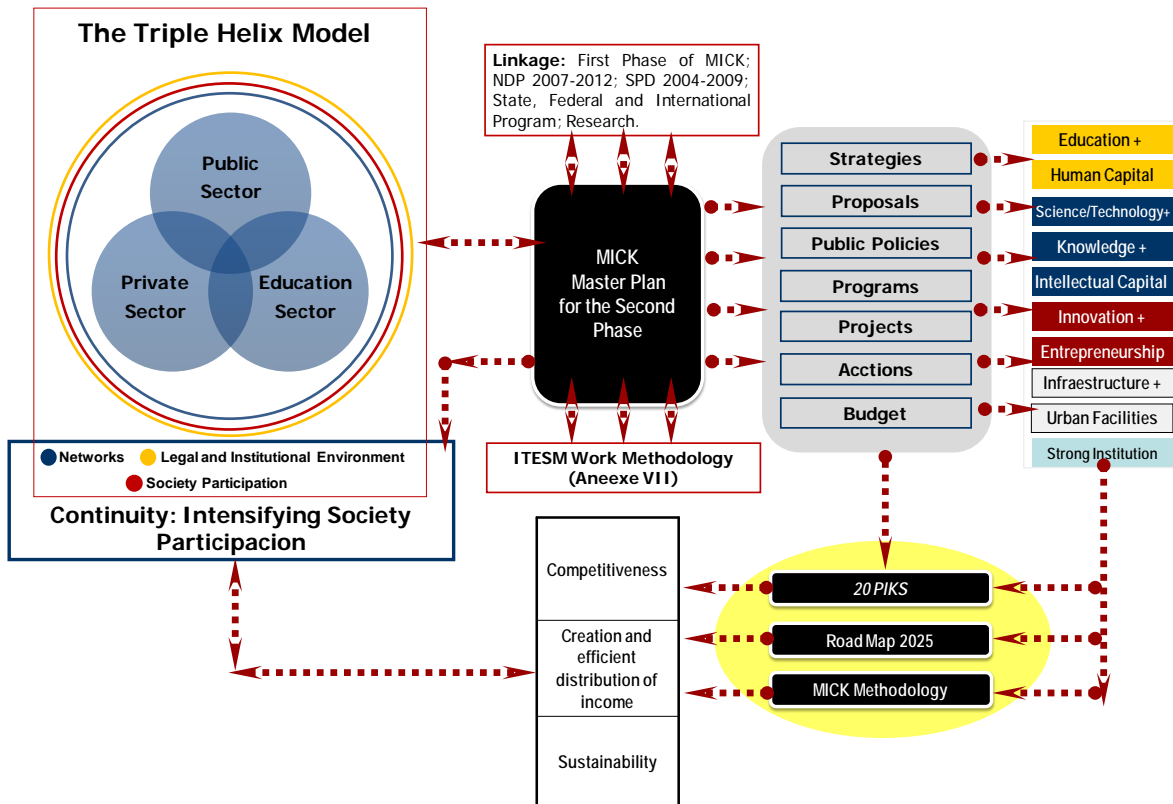
Regarding broadcasting and information to the whole population of Nuevo Leon, and especially in MMA, we suggest **designing and implementing a strong communications program with contents related to the benefits the MIKC Program has at individual and collective levels**, that motivates society's active participation in its development and consolidation..

Considering the proposal made by Jaime Parada Avila, PhD, General Director of the Innovation and Technological Transfer Institute of Nuevo Leon (I²T²) within the timeframe related to the interviews with actors relevant to Phase 2 of the MIKC Program ***"...to increase the population's awareness and participation, the MIKC Project must have a stronger presence, being broadcast in both radio and television..."***¹⁰ It is within this context that we recommend that the society have enough relevant information available regarding the objectives, advancements and tangible benefits of the program.

4.5 Summary Chart.

To conclude this chapter, the following chart synthetizes the topics covered.

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¹ Monterrey, Ciudad Internacional del Conocimiento (2008). Definición de la Ciudad del Conocimiento. Available at: <http://www.mtycic.com.mx/acercade.html>

² BBC Mundo (2008). El talento es su arma. Disponible en: http://news.bbc.co.uk/hi/spanish/science/newsid_7483000/7483335.stm

³ By Area of Science and Innovation Consortium (2007). Innovator Series: An Interview with Steven. San Francisco, California.

⁴ Monterrey, Ciudad Internacional del Conocimiento (2008). Definición de la Ciudad del Conocimiento. Available at: <http://www.mtycic.com.mx/acercade.htm>

⁵ Stolarick, K., Florida, R., Musante, L (2005, enero). Montréal's Capacity for Creative Connectivity: Outlook & Opportunities Available at: www.culturemontreal.ca/pdf/050127_catalytix_eng.pdf

⁶ The Case of Austin and Boston.doc

⁷ CNN Expansion (2008, May 21). Ciudades Digitales, el futuro de los servicios ciudadanos. (*Digital Cities, the future of the citizen services*) Available at:

<http://www.cnnexpansion.com/blogs/everis/archive/2008/05/21/ciudades-digitales-el-futuro-de-los-servicios-ciudadanos>

⁸ The knowledge cities: critical revision and possibilities of application to intermediate cities (May 2008)

⁹ Latin American Grid (2008). LA Grid Program. Available at: <http://latinamericangrid.org/index.php.es>

¹⁰ BOINC (2008). Open-source software for volunteer computing and grid computing", Berkeley. Available at: <http://boinc.berkeley.edu/>

¹¹ Agreement signed by the Nuevo Leon State Government, represented by the Strategic Projects Corporation, and the Universidad Autonoma de Nuevo Leon, the Instituto Tecnológico y de Estudios

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Superiores de Monterrey, and the Universidad de Monterrey, to promote the International City of Knowledge Program (2004).

Agreement established to promote the International City of Knowledge Program.