

**II ENCUENTRO UPR/MIT SOBRE EL TREN URBANO
11 AL 20 DE ENERO DE 1966
RECINTO DE RIO PIEDRAS
PUERTO RICO.**

URBAN CHANGE AND THE CARACAS METRO SYSTEM

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I. INTRODUCTION.

-NO TWO CITIES ARE ALIKE. NO TWO NEIGHBORHOODS ARE ALIKE.

**-GOOD PLANNING SEEMS TO DEPEND ON TRIAL AND ERROR AND ON THE ABILITY TO
RECOGNIZE THE OPPORTUNITIES AND RESTRAINTS WITHIN THE DIVERSITY, AND TO ADAPT,
ADJUST OR INVENT SOLUTIONS WHICH MAY BE ADEQUATE FOR A PARTICULAR CONTEXT.**

**-THE CARACAS METRO CASE, AS WELL AS THE ANALYSIS OF OTHER MASS
TRANSPORTATION SYSTEMS, MAY HELP TO DERIVE IDEAS AND INFORMATION POSSIBLY
ADAPTABLE FOR THE PLANNING, DESIGN, AND OPERATION OF EL TREN URBANO OF SAN
JUAN, AND TO GUIDE, INDUCE OR PREVENT URBAN CHANGES ASSOCIATED WITH THE
DEVELOPMENT OF SUCH A SYSTEM .**

**-THE PLANNING OF A MASS TRANSIT SYSTEMS MUST BE CARRIED OUT TAKING INTO
CONSIDERATION THE IMPACT THAT IT WILL HAVE ON CITY PERFORMANCE AND THE
OPPORTUNITIES IT PROVIDES TO INDUCE URBAN TRANSFORMATIONS.**

-OPTIONS:

A. TO CONSIDER THE PROJECT AS PART OF A COMPREHENSIVE PLANNING STRATEGY.

**B. TO CONCENTRATE EFFORTS ON THE TRANSPORTATION ISSUES AND GUIDE, STIMULATE OR
EVEN RESTRAIN FROM INTERVENING ON FORESEEABLE CHANGE.**

C . A+B

**APPROPRIATE ACTION WILL DEPEND ON LOCAL CONDITIONS, POLITICAL WILL, RELATIONS
BETWEEN PUBLIC AND PRIVATE SECTOR, AND ON LEGAL RESPONSIBILITIES, TECHNICAL
STRENGTHS AND TIES BETWEEN CENTRAL, REGIONAL AND LOCAL AGENCIES.**

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II. WHICH ARE THOSE OPPORTUNITIES?

THESE ARE:

-TO IMPROVE OR SOLVE TRANSIT PROBLEMS, IN RELATION TO OTHER MEANS OF PUBLIC AND PRIVATE TRANSPORTATION, THE ROAD SYSTEM, PEDESTRIAN OR BICYCLE PATHS, AIR TRANSPORTATION AND WATER WAYS...

-TO IMPROVE THE EFFICIENCY AND CITY QUALITY BY MODIFYING RESIDENT-EMPLOYMENT-COMMERCIAL AND RECREATIONAL RELATIONS AND THEIR LOCATION PATTERNS.

THE PLACEMENT OF STATIONS WILL INDUCE CHANGES IN LAND USE, DENSITY, LAND VALUE, FAVOR THE CREATION OR CONSOLIDATION OF SUB-CENTERS AND TRIGGER NEW URBAN TRENDS.

IN LOW DENSITY, DISPERSED AND SEGREGATED CITIES AND AREAS, THE SYSTEM PROVIDES THE OPPORTUNITY TO INCREASE DENSITY, FAVOR MIXED USE, AND ENHANCE URBAN ACTIVITY

IN HIGH DENSITY, TIGHT URBAN PATTERNS THE PROJECT ALLOWS TO EASE CONGESTION, CREATE OPEN SPACE, INTRODUCE NEW SERVICES AND GUIDE NEW URBAN DEVELOPMENTS.

-TO IMPROVE CITY INFRASTRUCTURE AND SERVICES. METRO PROJECTS USUALLY REQUIRE THE DETECTION, RELOCATION AND IMPROVEMENT OF INFRASTRUCTURE, FORCING DIFFERENT UTILITY AGENCIES TO WORK TOGETHER.

-TO IMPROVE MANAGERIAL SKILLS, CITY GOVERNMENT AND INSTITUTIONAL RELATIONS (PRODUCING CHANGES IN TECHNICAL-POLITICAL APPRECIATION), REQUIRING TO MANAGE SIMULTANEOUSLY TECHNICAL, LEGAL, FINANCIAL, SOCIAL, POLITICAL, OPERATIONAL, MAINTENANCE, AND CULTURAL ASPECTS.

THE SCOPE OF THE PROJECT MAY REQUIRE THE IMPLEMENTATION AND IMPROVEMENT OF DATA SYSTEMS AND CADASTER RECORDS. IT ALSO MAY OFFER THE OPPORTUNITY TO INTRODUCE CHANGES IN THE TAXATION SYSTEMS, APPLY REVALORIZATION TECHNIQUES...

REAL-ESTATE AND DESIGN ISSUES MAY REQUIRE THE INTRODUCTION OF NEW APPROACHES, TECHNICAL AND LEGAL TOOLS FOR THE CREATION OF URBAN FORM (SUCH AS THE NOTION AND INSTRUMENTS OF URBAN DESIGN VS TRADITIONAL ZONING) AND TO REDEFINE THE INTERPLAY BETWEEN THE PUBLIC, THE PRIVATE SECTOR AND THE COMMUNITY.

THE SYSTEM MAY INDUCE OR REQUIRE CHANGES IN CITIZEN BEHAVIOR, SUCH AS MODIFICATION OF HABITS IN THE USE OF PRIVATE CARS VS PUBLIC TRANSIT SYSTEMS, THE APPRECIATION OF THE URBAN ARENA, THE DEVELOPMENT OF A SENSE OF PLACE, CITY PRIDE AND THE CULTURE OF LEISURE.

THE CITY MAY PROVIDE WIDER CHOICE AND INTERACTION BETWEEN DIFFERENT SOCIAL GROUPS.

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III. SOME ISSUES, TRENDS OR EFFECTS TO BE AWARE OF, DURING THE PLANNING, DESIGN, CONSTRUCTION AND OPERATION PROCESS.

-AN OBVIOUS BUT NOT ALWAYS ACHIEVED GOAL IS THAT THE SYSTEM MUST WORK, THE PROJECT MUST MAKE SENSE, MOVE PEOPLE AND RESULT IN AND ALL AROUND COST-BENEFIT GOOD DEAL.

-THE STATIONS SHOULD BE LOCATED WHERE USER DEMAND EXISTS OR WILL EXIST WITH LITTLE EFFORT, ONCE THE PROJECT IS IN OPERATION.

-GREAT EFFORT SHOULD BE MADE TO LOCATE THE STATIONS ON THE MAIN CITY NODES AND CORRIDORS OR AREAS WHICH NATURALLY WILL ATTRACT USERS, WHO WILL CONSIDER THE SYSTEM A TRUE OPTION COMPARED WITH OTHER MEANS OF TRANSPORTATION.

THIS WILL REQUIRE HIGHER COSTS FOR THE ACQUISITION OF LAND AND TO ATTEND COMPLEX LEGAL, TECHNICAL AND OPERATIONAL PROBLEMS. THE BENEFITS WILL JUSTIFY THE INITIAL EFFORTS.

SPECIAL TAXATION METHODS, NEGOTIATION PACKAGES AND TRADEOFFS MAY BE SUITABLE APPROACHES TO REDUCE COSTS IN SUCH SITUATIONS, ESPECIALLY IN CONGESTED URBAN AREAS.

-BELOW GRADE SOLUTIONS ARE HIGHLY DESIRABLE IN DENSE URBAN AREAS, DESPITE THE COSTS. ELEVATED OR ON GRADE SOLUTIONS IN SUCH AREAS MAY RESULT IN NOISE, PHYSICAL BARRIERS, VISUAL POLLUTION AND EVEN PRESENT SECURITY AND MAINTENANCE PROBLEMS.

-AS MENTIONED BEFORE, LINES AND STATIONS IN VERY LOW DENSITY AREAS MUST BE PLANNED TAKING INTO CONSIDERATION THE OPPORTUNITY TO INCREASE DENSITY, CHANGE BEHAVIOR TOWARDS THE USE OF PRIVATE CARS, CREATE SUB CENTERS, EXTEND OR CONNECT TO COMMUTER RAILROAD... IN ORDER TO GUARANTEE DEMAND AND USER ACCEPTANCE OF THE SYSTEM.

-LINKING THE SYSTEM TO THOSE SERVICES OR URBAN COMPONENTS OF GREATER SIGNIFICANCE TO THE COMMUNITIES SUCH AS: HISTORIC CENTERS, MARKETS, MEDICAL CENTERS, UNIVERSITIES, RECREATIONAL CENTERS, SPORT FACILITIES, PARKS AND BEACHES ARE ISSUES TO BE CONSIDERED SERIOUSLY IN ORDER TO INDUCE USER RESPONSE, IN ADDITION TO THE EVALUATION OF DEMAND LINKED TO TRIPS BETWEEN RESIDENTIAL, EMPLOYMENT AND COMMERCIAL AREAS.

-THE DESIGN AND OPERATIONS OF THE SYSTEM MUST BEGIN LINKING AREAS WHICH WILL ASSURE HIGH USER RESPONSE, WHICH USUALLY MEANS CONNECTING LOWER INCOME AREAS TO MAJOR WORKING LOCATIONS AND PUBLIC SERVICES

-PLANNERS OF THE SYSTEM MUST INFORM THE PUBLIC (AND ALL GOVERNMENT AGENCIES) OF WHAT IS GOING ON AND COMING AHEAD, IN ORDER TO MINIMIZE POLITICAL RESISTANCE, MAKE THE PROJECT A JOINT VENTURE, RECOGNIZING DIFFERENT LEVELS OF RESPONSIBILITY.

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-EFFORTS SHOULD BE MADE TO MINIMIZE FURTHER CONGESTION, NOISE ENVIRONMENTAL DECAY AND COMMUNITY INCONVENIENCE DURING THE EXECUTION OF THE PROJECT.

-AREAS NEAR STATIONS BECOME MORE FAVORABLE LOCATIONS FOR COMMERCIAL OR MIXED USE. HOW TO DEAL WITH THIS TREND?

LAND VALUES TEND TO RISE. HOW CAN THE CITY AVOID SPECULATION, FORESEE OPPORTUNITIES TO CAPTURE PUBLIC LAND, VISUALIZE AND UNDERTAKE REASONABLE PUBLIC-PRIVATE GOOD QUALITY DEVELOPMENTS.

WEAKER URBAN STRUCTURES SUCH AS LOW INCOME HOUSING AREAS, DETERIORATED TRADITIONAL NEIGHBORHOODS, LOW RENT AREAS... GO UP IN VALUE. HOW CAN THE CITY AND THE PRIVATE SECTOR BENEFIT FROM THESE CHANGES WITH OUT HARMING THE ORIGINAL RESIDENTS OR ENDANGERING IRREPLACEABLE CITY FABRICS?

IV. THE CARACAS METRO

CITY INFORMATION:

- 1 -CAPITAL CITY OF VENEZUELA
- POPULATION: 3.5 MILLION+.7 MILLION DAILY COMMUTERS
- POPULATION IN INFORMAL SETTLEMENTS: 1.2 MILLION
- 2 -ECONOMY: POLITICAL, ADMINISTRATIVE, TRADE AND SERVICE CENTER. -NATIONAL OIL REVENUES FUEL ENORMOUS BUREAUCRACY REPRESENTING A MAJOR LABOR FORCE ON THE COUNTRY AND CITY.

URBAN ASPECTS:

- 3 LINEAR DEVELOPMENT PATTERN DUE TO GEOGRAPHICAL CONSTRAINTS. (NARROW VALLEYS).
VERY HIGH DENSITY, NO AREAS FOR CITY EXPANSION. THE URBAN STRUCTURE IS A MIXED USE, MULTINODAL PATTERNS, STRETCHING ALONG MAIN CORRIDORS. DENSITY TENDS TO DIMINISH AND RESIDENTIAL USE TO INCREASE AWAY FROM MAIN CORRIDORS.
- 5 THE CITY EXPERIENCES CONSTANT INCREASE OF DENSITY AND CHANGES IN URBAN FORM, IN FORMAL AND INFORMAL AREAS.
- 6 LOW INCOME INFORMAL SETTLEMENTS LOCATE TOWARDS THE OUTER CITY.
- 7 EXTENSIVE BUT OVER CONGESTED HIGHWAY INNER CITY SYSTEMS OCCUPY A HIGH PERCENTAGE OF OPEN SPACE.
HIGH PRIVATE CAR OWNERSHIP. LOWEST GAS PRICES IN THE WORLD.
HIGH MOBILITY WITHIN THE VALLEY AND TOWARDS SATELLITE URBAN CENTERS.

HEAVY CONGESTION LED 20 YEARS AGO TO CONSIDER THE CONSTRUCTION OF THE METRO AS A NATIONAL AND CITY PRIORITY. SEVERAL OPTIONS WERE CONSIDERED, SUCH AS THE CONSTRUCTION OF AN ELEVATED MONORAIL.

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9 THE VERY HIGH DENSITY AND LINEAR URBAN PATTERN OF THE CITY PROVED THAT, DESPITE THE HIGH COSTS FOR LAND EXPROPRIATION AND TECHNICAL DIFFICULTIES, THE METRO WAS THE MOST APPROPRIATE SOLUTION.

RELEVANT SYSTEM FEATURES:

ESQUEMA

- THREE LINES IN OPERATION (CLOSE TO 50% OF THE COMPLETE NETWORK AS PLANNED)
- OPERATION FIRST BEGAN IN 1983
- 43 KM OF LINES
- 42 STATIONS
- 1.3 MILLION PASS/DAY
- 25 METROBUS CONNECTING LINES (INCLUDING 3 COMMUTER ROUTES)
- 80% OF SYSTEM BELOW GRADE

- FINANCED BY FEDERAL FUNDING
- CREATION OF A AUTONOMOUS CARACAS METRO AGENCY, HIGHLY REGARDED BY PUBLIC-PRIVATE SECTOR AND COMMUNITY.
- LOCAL MANAGERIAL AND TECHNICAL STAFF IS THE SAME TEAM SINCE BEGINNING OF PROJECT. NATIONAL AND FOREIGN FIRMS BID ON CONSTRUCTION AND SUPPLIES.

URBAN CHANGE:

- THE CARACAS METRO IS THE MOST IMPORTANT URBAN PROJECT IN THE CITY'S HISTORY, CHANGING IN SHORT TIME ITS ENTIRE PERFORMANCE AND THE ENVIRONMENTAL QUALITY.

THE CITY PULLS TOGETHER

- 10
- THE METRO HAS PULLED TOGETHER A CONGESTED AND SEGREGATED URBAN FABRIC, MAKING IT MORE COMPETITIVE WITH IN THE NATION AND THE CARIBBEAN MARKETS AND MULTIPLYING THE OPPORTUNITY OF CHOICE OF JOB, PLACE OF RESIDENCE, PARTICULARLY FOR LOW INCOME USERS.
 - IT HAS VIRTUALLY SAVED CARACAS FROM TOTAL PARALYSIS, RESULTING IN LESS CONGESTION IN CERTAIN CORRIDORS AND DRASTIC REDUCTION OF TIME DEDICATED TO MOVE AROUND WITHIN THE ENTIRE CITY.
- 11
- THE METRO HAS MADE THE CITY MORE DEMOCRATIC, REDUCING SOCIAL SEGREGATION AND TENSION.
 - THE POPULAR USE OF PREVIOUS SELECTIVE COMMERCIAL FACILITIES AND URBAN AREAS, THE OVERCROWDING OF PARKS AND MUSEUMS, THE EMERGENCE OF NEW BUSINESS ACTIVITIES IN INFORMAL AREAS, ARE INDICATORS OF SUCH CHANGE.

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MASS TRANSIT IS ASSOCIATED WITH AN UNDERGROUND HIGH QUALITY SYSTEM OF PUBLIC SPACE.

- 12 -AFTER 12 YEARS IN SERVICE, THE TRAINS, STATIONS, GALLERIES, PASSAGES STILL ARE HIGH QUALITY ENVIRONMENTS DEFENDED BY THE USERS. A STRONG SENSE OF PLACE IDENTIFIES EACH STATION, FREQUENTLY OFFERING CLUES TO THE AREAS ABOVE.**
- 13 -A COMBINATION OF PLANNED TECHNIQUES TO CREATE A USER-FRIENDLY ATTITUDE, EDUCATING VS. ENFORCING, ASSURING A-1 SERVICE, TOGETHER WITH HIGH QUALITY DESIGN, MAINTENANCE, PERSONNEL TRAINING, PUBLIC RELATIONS... HAVE LED TO THIS REMARKABLE SUCCESS WITH IN A DIFFICULT URBAN CONTEXT SUCH AS CARACAS.**
- 14 MAJOR URBAN IMPROVEMENTS AT THE SURFACE WERE CAREFULLY PLANNED, DESIGNED AND BUILT BY THE METRO AGENCY.**
- 15 THE METRO TURNED AROUND NEGATIVE TRENDS, BY CREATING MORE THAN 30 KMS OF PEDESTRIAN MALLS, PARKS, PLAZAS, LINKS, WHICH TOGETHER WITH LANDSCAPING, FOUNTAINS, STREET FURNITURE, HAVE INTRODUCED THE NOTION OF WIDE SPREAD URBAN DESIGN OVER PUBLIC TURF. STREETS WERE RECUPERATED FOR PEDESTRIANS, METRO STATIONS BECOME COMMUNITY MEETING PLACES AND SERVICE CENTERS .**
- 16 THE DESIGN PROPOSALS ENLIGHTEN PARTICULAR FEATURES OF EACH LOCATION, MAINTAINING THE UNITY OF DESIGN ELEMENTS, USE OF MATERIALS, COLORS THROUGHOUT THE CITY. THIS, IN TURN, HAS SET GUIDELINES FOR OTHER PUBLIC AND PRIVATE CITY IMPROVEMENTS**
- 21 ART WORK IS A RECURRENT THEME WITHIN THE STATIONS AND IN OPEN PUBLIC SPACE.**
- 22 CITY IMPROVEMENTS AND INCREASED LAND VALUES TRIGGERED LARGE AND SMALL SCALE DEVELOPMENTS, AND HAVE FAVORED NEW COMMERCIAL ACTIVITY AND AFFECTED THE ENTIRE CITY DYNAMICS.**
- 23 THE CULTURE OF LEISURE AND USER ACCEPTANCE.**

PROBABLY ONE OF THE MOST IMPORTANT EFFECT OF THE CARACAS METRO WAS THAT IT HAS OFFERED THE COMMUNITY FREE TIME TO RELAX, ENJOY SPORTS, CULTURE AND URBAN LIFE. THIS IS NATURALLY DIFFICULT TO QUANTIFY. HOWEVER IT IS A KEY ISSUE IN MEASURING SUCCESS OF SUCH A PROJECT.

IT IS DIFFICULT TO THINK OF CARACAS WITH-OUT ITS METRO. ALTHOUGH MOST USERS HARDLY REMEMBER HOW IT WAS BEFORE THE SYSTEM EXISTED OR WHILE CONSTRUCTION WAS UNDER WAY.
- 24 THE METRO HAS MOTIVATED A SENSE OF PRIDE, RESPECT AND IDENTIFICATION OF THE USER TOWARDS THE SYSTEM AND IN TURN TOWARDS THE CITY.**

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THE METRO HAS HELPED PLANNERS, POLITICIANS, DEVELOPERS AND THE COMMUNITY TO RETHINK THE CITY AND GIVE A NEW APPRECIATION TO URBANITY. THIS IS THE PRINCIPAL GOAL ASSOCIATED WITH THE CONSTRUCTION OF A MASS TRANSIT SYSTEM.

CONCLUSIONS:

-THE PLANNING AND CONSTRUCTION OF A MASS TRANSIT SYSTEM REPRESENTS A UNIQUE OPPORTUNITY TO FAVOR URBAN CHANGE, IMPROVE CITY PERFORMANCE, DEVELOP MANAGERIAL SKILLS AND CREATE A BETTER BUILT ENVIRONMENT.

-THE SUCCESS IN UNDERTAKING SUCH A PROJECT MAY RELY ON THE ABILITY TO UNDERSTAND THE PARTICULAR CONDITIONS OF THE CITY AND ITS NEIGHBORHOODS AND TO BE ABLE TO ORGANIZE PLANNING DESIGN TEAMS WHICH ARE ABLE TO MANAGE SIMULTANEOUSLY THE DIVERSITY OF POLITICAL, TECHNICAL, FINANCIAL, LEGAL, SOCIAL, QUALITATIVE AND AESTHETIC ISSUES INVOLVED.

GOOD RELATIONS, TRUST AND UNDERSTANDING BETWEEN DIFFERENT GOVERNMENT AGENCIES (FEDERAL, REGIONAL & LOCAL), AS WELL AS WITH THE PRIVATE SECTOR AND THE COMMUNITY ARE MOST NECESSARY.

PLACING THE USER AT THE CENTER OF ALL OTHER CONSIDERATIONS, UNDERSTANDING CULTURAL ISSUES, BEHAVIORAL PATTERNS AND FORESEEING HOW FAVORABLE TRENDS CAN BE ENHANCED AND NEGATIVE ONES MAY BE IMPROVED ARE KEY ISSUES FOR THE SUCCESS OF THE PROJECT.

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