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Developing and Managing Municipal Infrastructure Development Plans

Introduction

Managing rapid urbanization is a primary challenge facing many cities, and particularly pressing is the need to provide adequate infrastructure in transportation, water treatment, housing, sewage, and solid waste. However, many local governments—particularly in small and medium-sized cities in developing countries—lack the organizational structures and authority to undertake infrastructure development initiatives. For example, they might lack properly staffed departments of finance, and the proper mechanisms and regulations for public–private investment are often not in place. Similarly, many cities lack the capacity for financing these investments, even when these assets have the potential to become sources of revenue generation.

There are a variety of ways local governments can finance infrastructure development. These include tax increment financing and municipal bonds as well as other land value capture mechanisms. In many cases, land use planning regulations require developers to fund infrastructure construction as a condition for receiving permits to undertake residential or commercial building projects. The primary problem for small and medium-sized cities in developing countries is the large time lag between the initial investment in infrastructure and the return on this investment in the form of development fees and tax revenues reaped from infrastructure-enabled economic growth. In the case of large-scale water and sewage facilities, this lag can be especially long—10 to 20 years. Particularly in developing countries, it is difficult to secure the necessary interim financing because local governments have neither the credit rating, nor a history of responsible fiscal management, nor appropriate legal or institutional mechanisms (e.g., development levies, betterment taxes, development corporations).

The challenge lies not in the invention of new municipal finance models, but rather in creating the specific local government institutional mechanisms needed to undertake local government–led infrastructure development.[1]

This chapter provides background on city-led infrastructure development and presents a practical framework for how local governments can create the conditions for mobilizing private sector resources to finance infrastructure and construct the appropriate facilities. This framework includes feasibility analysis to determine how infrastructure development can be designed to be feasible in a given city; legislation that sets and enforces standards and that provides legal mechanisms for local government to finance infrastructure construction; financing strategies; and organizational platforms for local development (e.g., legal subsidiary entities/development companies) that have the professional capacity to manage these complex projects.

Mandate for local government in infrastructure development

The provision of adequate infrastructure and services is necessary to provide both a high quality of life and an environment conducive to business. This includes everything from safety in the streets, proper sewage drainage, and quality schools to health care, roads, and public parks.

Adam Smith, who laid the intellectual foundation for free-market capitalism, clearly argues on behalf of governmental responsibility for critical infrastructure, writing that among government's fundamental duties is "erecting and maintaining certain public works and certain public institutions which it can never be for the interest of any individual, or small number of individuals, to erect and maintain; because the profit could never repay the expense to any individual or small number of individuals, though it may frequently do much more than repay it to a great society."[2]

While infrastructure provision has traditionally been the job of national government, the complexities, nuances, and dynamics of urban life have led local government to play an increasingly prominent role. Yet, local governments are still often without the legal mandates, the organizational structures, and financing capacity needed to take on these functions. Especially in developing countries, local governments do not usually have the local ordinances and related legislation that enable them to collect development fees and other taxes that serve as the foundation for financing infrastructure development. Nor do they have suitable organizational frameworks that can function in an entrepreneurial manner necessary to carry out the complex tasks of project management and fiscal management of infrastructure development.

The action strategy

The main challenge facing local government is how to create the conditions for mobilizing private sector resources to finance infrastructure and construct the appropriate facilities. This is not an abdication of public sector responsibility—quite the opposite, in fact. Local governments need to set standards, develop enforceable procedures, and anchor development fees/levies in specific by-laws/ordinances. They must establish dedicated organizational and institutional frameworks to manage infrastructure development in a way that enables them to harness often-hidden local economic resources.

Developing and implementing such a strategy of action should have four primary components: a feasibility analysis, authorizing legislation, financing strategies, and organizational platforms for local development.

Feasibility analysis

A feasibility analysis determines not whether infrastructure development is feasible in a given city, but rather how it can be designed to be feasible. This type of analysis involves:

- Assessing the scope of need of different types of infrastructure (roads, sewage treatment, water treatment, waste disposal, power generation, etc.). This needs to be based upon population projections, the number of housing units, and existing infrastructure capacity. This assessment must also identify the city's strategic assets and assess what types of infrastructure are needed to link these assets to each other and to different population groups.
- Assessing the economic capacity of the different populations moving into the city. This entails determining how much different communities can pay for housing and related infrastructure, what share of the housing costs would go towards infrastructure, and what part of infrastructure costs residents should pay versus what part should be transferred to the business sector.
- Determining the standards and technologies best suited to meet the demands for urban growth for both residents and businesses.
- Estimating the overall costs for the different types of infrastructure required, as well as specific costs for different geographic and socio-economic areas.

It is important to ensure that the municipal level of infrastructure planning dovetails with regional- and national-level infrastructure projects. This is critical both for ensuring that infrastructure development is coordinated and to properly divide the different levels of funding responsibilities.

Authorizing legislation

In the past, infrastructure solutions—septic tanks, wells, runoff drainage, and even dirt roads—were tenable at the household level. But this is no longer feasible given today's rapidly growing urban areas. Although there are regional/county-level initiatives for water purification, sewage treatment, and other types of infrastructure, the legal authority for local government to set and enforce standards is often weak. Equally, if not more critically, there are often no legal mechanisms for local government to finance the cost of infrastructure construction. (For example, there are no legislated provisions for deficit financing or for entering international financial markets.) In many instances, there are no legal statutes that give local governments the authority to make provision of infrastructure, or payment for the provision of infrastructure (through development fees), a condition for approval of building permits.

The transition here is not only one of setting and enforcing standards, but a change in the position and role of local government. It places the burden of infrastructure provision on the municipality and necessitates that it has the authority to finance infrastructure development. In the reality of devolution, local government today is often already accountable to the residents, but without the tools to deliver.

Passing a bill for the levying of development fees is one possible legislative remedy. Such a bill would not only integrate the different legal anchors, but also give the municipal government a mechanism for enforcement. Local government legislation (ordinances or bylaws) is needed to mandate development fees and give local government the authority to do the following:[3]

1. To make granting a building permit conditional upon payment of a development fee or provision of the infrastructure as set by municipal standards (secured by some form of collateral or bank guarantee).
2. To give the municipality the authority to levy development fees for roads, water supply, sewage treatment, and drainage, and for these fees to be paid to the local government in a closed account (specifically for the given area of development or the related regional system) in keeping with the pace of infrastructure construction. This is to be done in stages and kept in accounts separate from the regular local budgets.
3. To give the municipality the power to finance infrastructure through different mechanisms—bank loans; bonds; joint ventures; build, operate, transfers (BOTs)—that are based upon investment today against future generation of revenues. This type of legislation also needs to include the institutional safeguards and economic guarantees that provide investors with the security needed to protect their investment.

The intention here is not necessarily for local government to go into the business of infrastructure construction across the board, but rather to give it the authority to do so when private developers do not meet standards. Private developers may very well be the ones to construct community sewage treatment or lay pipes to connect to regional sewage treatment systems, but a municipality needs to have the option to contract out for the construction of infrastructure when the developers cannot provide adequate solutions or when the solutions are required at the regional or sub-regional level. Developers will need to pay the municipality a development fee for those infrastructure components that they themselves are not providing.

Financing strategies

Infrastructure development requires a comprehensive approach. Cities are far from homogeneous; different socio-economic circumstances greatly influence citizens' and businesses' ability to pay for infrastructure costs. Additionally, many elements of infrastructure cut across geographic and demographic boundaries. Likewise, different groups have different levels of use even of the same type of infrastructure. This requires mixed funding sources and differential fees that are equitable and progressive (see Table 1).

Funding sources can in part be based upon the ability of economically wealthier populations to contribute, especially with regard to regional-level infrastructure such as water and sewage treatment plants or trunk roads. At the same time, donor funds or national development budgets can help close the gap between actual costs and economically weaker populations' ability to pay the full amount.

Not only is there a need for differential funding sources, there is also a need for different tracks of implementation. Take the example of a water treatment plant:

1. The local government (or local infrastructure authority or other development entity) can provide the necessary infrastructure using the income from a development levy to construct a new plant or expand central systems.
2. A private developer (housing estate or business centre) could construct a neighbourhood treatment facility under local government supervision/regulation, and the water treatment development levy would be reduced by the value of the treatment facility built by the developer (e.g., by 70–80 per cent). The remainder of the fee would cover other costs beyond the neighbourhood level for water supply.
3. The development levies serve as the source of funding for build, operate, and transfer (BOT) of a regional water treatment facility that could also include an operational income and management component.

The underpinnings of this overall infrastructure financing and development strategy are well established in many cities throughout the world, but almost exclusively in developed countries where there is a longstanding practice of municipal government having the mandate and statutory authority to provide infrastructure. In such localities the economic model is straightforward. The local government invests in planning, which delineates scope, location, technologies, stages/timing, and costs of different infrastructure components. Based upon these plans it is possible to set development fees or taxes to be paid by developers of housing projects or commercial ventures. Once these steps have been taken there are many ways of securing interim financing, ranging from municipal bonds to commercial bank loans. Thus infrastructure provision can be ensured.

There are already a number of variations on this theme that can be adopted and adapted. They range from full privatization of certain local government functions (as is often the situation with solid waste and liquid waste management) to contracting out for very specific planning or construction projects where the local government purchases services from private sector vendors.

Table 1. Metropolitan and local finance systems

Government level	Sectors	
State/province/regions	Health, inter-urban trains, bulk electricity generation, water management, etc.	
Metro-level cross-local government (e.g., city regions)	Education, metro rail, water supply/ sanitation, etc.	
Development area/corridor authorities	Area/corridor transport and urban renewal	
Local government	Solid waste, local roads, parks, etc.	

** Collection yield refers to how much of the tax/fee due is actually collected.*
*** Systems refer to best-practice and technology supports available to maximize efficiency of use and yield.*
**** System upgrades to minimize "leakage" in collection and maximize transparency/accountability.*

However, the challenge facing local governments in developing countries is more complex. They have neither the credit ratings nor the funds for planning infrastructure development as a financially secure venture. In this situation there needs to be a more explicit linking of the economic potential inherent in urban development and the financing of infrastructure.

One of the main concerns of financing institutions is the ability of local governments to provide guarantees against loans. Similarly, they need a clear business plan that clearly presents the risks and opportunities of specific infrastructure projects. Although as mentioned local governments in developing countries do not usually have such resources, many private developers who need infrastructure to undertake their business projects (housing estates, industrial parks, or commercial ventures) can provide the types of guarantees needed to secure the financing of infrastructure.

By linking the granting of building permits to the provision of bank guarantees (plus partial payment of development fees) for the cost of infrastructure (as set out in local legislation described in the previous section), local governments can leverage such guarantees to meet the requirements for commercial loans, municipal bonds, or other investment mechanisms.

Furthermore, once these financing components are in place investors can weigh the costs of funding the planning stage of projects as a part of a much larger investment with good rates of return from the financing of a full infrastructure project.

Revenue sources for		Collection yield*	Systems**	Systems to maximize net revenue***
Capital expenditures	Operating expenditures			
General taxes (e.g., income & VAT), bonds, project loans	User fees, taxes	Rarely fully cost recoverable, but relatively easy to police payment	Health cards, smart grid, water auctions	Transparent bidding for concessions/ suppliers/use rights
Shares of general taxes, property tax levies, bonds, project loans	User charges, CSO transfer revenue	With the exception of water supply, rarely cost recoverable, but more difficult to police access	Integrated ticketing, smart metering	GIS-based property tax monitoring and automated billing and other IT systems to maximize yield. Crowd sourcing of service issues and responses.
Property taxes, project loans	As above	Commercial basis; corporation should be in surplus	Eminent domain, area-based tax surcharges	Land banking/performance-based bids
As above, plus limited bonds, transfers	As above	As for metro level	Cost recovery pricing	As for metro and development area levels

Source: Lindfield, Kamiya, and Eguino, Sustainable Metropolitan Finance for Development: Global Policies and Experiences for the New Urban Agenda and Local Finance (Washington, D.C., and Nairobi, UN-Habitat and IADB, 2016)

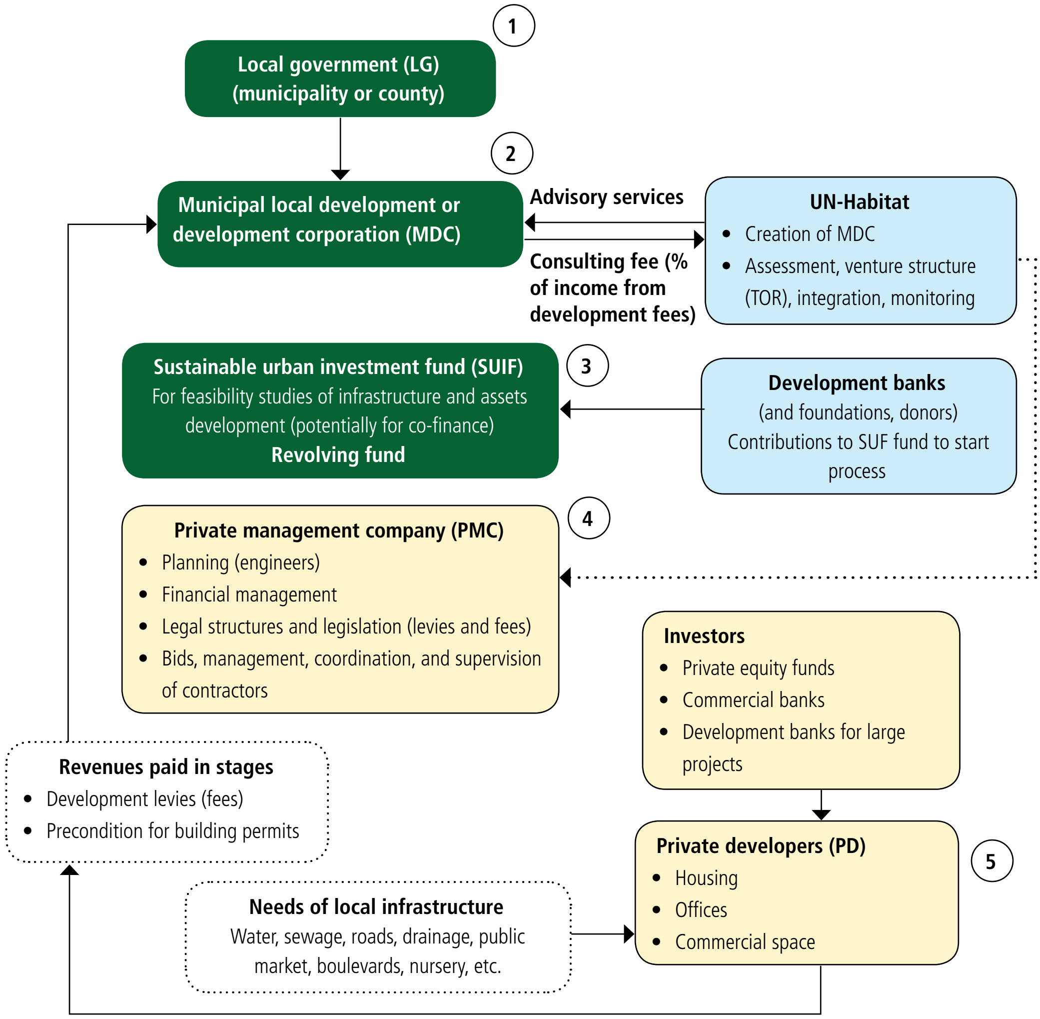
Platforms for local development

The role of local government as a universal service provider and enforcer of regulations almost by definition requires a formal bureaucratic organizational structure with sets of standardized procedures. Such a structure is poorly designed for the tasks of leading, developing, and responding to the demands of rapid urbanization. The principle of serving people equitably has come to mean providing the same standard of service to people regardless of who they are. This lack of flexibility is intended to prevent corruption or biases. Even though the reality is often quite different, the underlying principle is an important tenet of government. Yet this very tenet limits the abilities of government—and local government, in particular—to act quickly and flexibly, so as to capture opportunities. For example, procurement procedures designed to open opportunities to all contenders may prevent joint ventures initiated by the private sector. In addition, budgetary deficits are a bottomless well that can easily "absorb" any new revenues.

One way to reduce such difficulties and change the mode of bureaucratic operation characteristic of local government is by establishing subsidiary development and management platforms. One such platform is a sustainable urban investment fund (SUIF). An example of a SUIF is depicted in Figure A.

A view of Antananarivo, Madagascar **© UN-Habitat**

Figure A. Example of a sustainable urban investment fund



Functioning scheme

1. Local government (LG) creates or strengthens a municipal development corporation (MDC). LG requests support from UN-HABITAT or development bank.
2. UN-HABITAT helps the local government establish the technical capacity and find the resources necessary for the MDC to operate.
3. The sustainable urban investment fund (SUIF) is created. This fund should be replenished by the income and revenues generated by development levies from the infrastructure projects. Revenues can also come from urban integrated projects and/or the associated infrastructure itself that comes from land value capture, taxes, and others. This is a revolving fund that is replenished by the constant flow of funding from private developers.
4. The MDC uses the resources from the SUIF to prepare terms of reference and call for private management companies (PMC). The PMC will manage the bidding process and select and supervise private developers.
5. The revenues obtained from private developers go to the MDC, which uses the funding for proper revenues, replenishes the SUIF, and pays agencies (UN-HABITAT, consultants, etc.).
6. The revenues are paid in stages in keeping with the actual construction of the infrastructure. These payments go to the MDC, which reinvests them in the SUIF.

The mandate for a SUIF

Setting up a carefully constructed organizational framework with a dedicated mission, such as a SUIF, can provide the means for local government to meet challenges of urban development. In most countries local government has the authority to create such entities. The case of Kenya, which is in the process of devolution, provides a good example. The County Governments Act 17 of 2012 states, "To ensure efficiency in the delivery of service or carrying out of a function for which the county government is responsible, the county government may establish a company, firm or other body for the delivery of a particular service or carrying on of a particular function." Thus we can clearly see the authority for setting up a separate legal entity by the local government alone or in partnership for the purpose of carrying out its responsibilities.

Goals of a SUIF

A SUIF combines social goals with economic viability and sustainability. Because this type of framework is an economic entity, the income and expenditures are focused on ventures within a local development and revenue enhancement strategy. Income generated is aimed at the achievement of development goals. Because this is a separate entity, its activities and financial management can be more easily monitored. Such transparency is critical for instilling trust. A SUIF typically has a mandate to:

1. Undertake development projects on behalf of the municipality
2. Enter into contractual relations with private bodies for the achievement of its development goals
3. Manage and develop public assets
4. Purchase and sell goods and services related to the development goals
5. Own and manage land-based development projects

On the one hand it is intended to be the integrating mechanism for coordinating the initiatives of the different bodies within the local government—and on the other hand, it is the legal entity that can enter into partnerships and finance projects with the private sector.

Business strategy of a SUIF

A SUIF, though not immune to business difficulties, needs to operate on the basis of its public mandate. The business strategy is essentially one of low-risk ventures that rest primarily upon leveraging publicly owned lands and other assets. As such, the primary function of a SUIF is the transformation of public assets into economic ventures through various types of partnerships and financing and/or legal mechanisms.

Investments for these ventures can come from development agencies, income from current or future levies/taxes grounded in bylaws/ordinances, development fees, rents from facility/property management, and fees for development services.

Likewise, the SUIF can serve as the vehicle for entering into public–private partnerships in which it brings public assets to the partnership and in which private partners bring financial investments and professional expertise.

There are two generic development strategies that a SUIF can adopt:[4]

1. A SUIF can manage the development of local infrastructure (roads, sewer lines, streetlights, etc.) that would be funded primarily from development fees.
    - Payment of development fees would need

to be a precondition for granting a building permit, combined with bank guarantees by private developers for completion of payment as infrastructure is constructed. This type of infrastructure development can be done directly by the SUIF or with private sector partners.

- Additional income can come from land rates and betterment taxes that are based upon the increased value of lands that have resulted from infrastructure development.

2. A SUIF can develop and manage publicly owned properties/lands by using the rental income to finance asset development and for promoting other development projects.

    - The SUIF can leverage the land ownership/use rights and develop tailored-made buildings to suit the businesses or residents. The financing would be based upon leasing agreements that can ensure income to cover the costs of asset improvement.
    - The SUIF leverages land owned by the local government at its market value in partnership with a private investor/developer (its equity position is equal to land value in relation to overall development costs). These types of joint ventures are an effective structure for financing projects aimed at leveraging local government assets.

In short, a SUIF can improve local government's ability to enter into contractual relations on a partnership basis and/or as a developer with other public and private bodies in a flexible manner. Its significance is in its unique position as being an arm of local government while at the same time being able to act as a dedicated development platform whose monies and financing mechanisms are not part of the local government apparatus. In this manner it can contribute to the development of local infrastructure, improve local government-owned assets, enhance the revenue base, and contribute to the conditions that foster local economic growth.

Slum upgrading project in Kibera-Nairobi, kenya © **UN-Habitat**

Conclusion

Due to global trends towards devolution, the role of local governments has greatly expanded. They are now responsible for numerous development initiatives, including infrastructure development. However, local governments, particularly those in developing countries, lack the authority to finance and coordinate infrastructure development through levying development fees, issuing municipal bonds, and mobilizing private sector resources. In order to increase the provision of sustainable urban infrastructure, however, this must be altered so municipalities are empowered to finance infrastructure through various mechanisms.

As a result of the large time lag between the initial investment in infrastructure and the associated return on the investment, securing interim financing from municipal bonds or commercial bank loans can be difficult. For local governments in developing countries, this is extremely challenging, as most have neither the credit ratings nor the guarantee to secure loans. Regardless, there are other mechanisms that allow local governments to secure interim financing. For instance, most private developers who need infrastructure to undertake their business projects (housing estates, industrial parks, or commercial ventures) can guarantee loans. By linking the granting of building permits and other permits to the provision of bank guarantees for the cost of infrastructure, local governments can then meet their guarantee requirements.

The resources of the private sector should also be adequately mobilized to finance infrastructure development. One way of doing this is through a sustainable urban investment fund (SUIF), which is a subsidiary development and management platform. As a separate entity, a SUIF is charged with undertaking development projects by managing and developing public assets on behalf of the municipality. It enters into contractual relations with private bodies for the achievement of its development goals and serves as the vehicle for entering into public–private partnerships in which local governments bring public assets and private partners bring financial investments and professional expertise.

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Case Study 1: Megiddo Regional Council (a small local regional government in Northern Israel)[5]

The context

Like most local authorities, the goal of the Megiddo Regional Council was to develop an industrial park as part of its economic development strategy. The financing was to come from the national government to prepare a statutory zoning plan, build the roads, and put in a sewage system, electric lines, drainage, etc. This would then provide an attractive site for expanding local businesses and attracting new businesses, and would similarly be a significant source of land tax income to improve services.

The local government was successful in having the national government cover the costs of a land use plan. However, for over five years after the completion of the plan, the Megiddo Regional Council was not successful in receiving the necessary national government funds for infrastructure development. This led the mayor to consider a more entrepreneurial strategy.

Interim financing alternatives

A preliminary feasibility analysis concluded that the cost of the infrastructure, approximately US$20 million, could be covered from development fees over a 10-year period.

Initially there were three possible finance alternatives:

- Bank loan: This would carry an interest rate of at least 6 per cent and would require national government approval. The primary source of revenue would come from the payment of development fees paid by the businesses as they requested building permits.
- Municipal bond: This would be an approximately 5.5 per cent interest-bearing bond to the public, which would cost less to the municipal government but would also require national government approval. Furthermore, this option would be a precedent with all the related complexities and bureaucratic procedures of being "first."
- Joint venture with a private developer: This option was designed as a bid to a private management company (PMC) that would be given the rights to undertake the infrastructure development. The PMC would take on the burden of interim financing and in return would receive all of the development fees and a per cent of the land tax revenues for 10 years.

Taxing the national government as "landowner"

After a series of considerations, a strategic decision was made by the Regional Council to radically change the local government–national government relationship by fully using the statutory regulations mandated to local government, giving it the authority to levy development fees for infrastructure construction to be paid by landowners. Rather than request a development allocation for the industrial park from the national government, the local government taxed the national government US$20 million as the "landowner." (In Israel, the national land authority is the primary owner of lands, which are leased to residents and businesses on a 49-year renewable basis.)

Most development fees in Israel are billed to landowners based upon a fixed rate per square metre of buildings constructed on a plot of land. Thus the problem of interim financing still remained. The solution that led to the actual development of the industrial park came in the form of restructuring the bylaws to levy development fees on developed land (land with infrastructure) rather than upon the construction of buildings.

The legal structure

The legal mechanism that was used to implement this strategy of development was the establishment of a municipal corporation for the development and management of the industrial park—marketing, providing municipal services (solid waste, sewage, lighting, gardening, water supply, and other services), and collecting taxes.

The outcome

From the revenues generated by the development fees, the municipal industrial development company not only covered the development costs, but also made an operational profit (which has enabled the development corporation to initiate other new ventures). Additional revenues are being generated by an expanded tax base:

- Betterment tax that is levied against the increased market value of the property as a result of the infrastructure improvement (beyond the direct costs)
- Annual land tax that is based upon the size and type of land use (commercial, high tech businesses, manufacturing, and other industrial concerns)

In the long term there will be both job creation with new career tracks and secondary businesses that grow around the newer big businesses.

Aerial view of Megiddo, Israel © **Wikipedia**

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Endnotes

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