Introduction: A 21st Century Approach to Site Design

Land planning and civil engineering design has stagnated for the past 50 years despite the fact we have advanced more in field and office technology during that period than the last 5,000 years!

In this document we will intermix land planning and civil engineering under the term ‘site design’.

Why is ‘Site Design’ Important?

For the land developer, the design of the site is a major factor in the success of the development. The site design is essentially the land developers business plan. To the city the development sits within, the resulting real estate values (or lack of), as well as the efficiency of the infrastructure determines if the development will be an asset or liability long after the developer leaves. But more important, quality of life is heavily influenced by the effort made in ‘site design’, as well as the projects impact on the environment. Moreover, a bad site plan lowers surrounding values, while a great site plan raises nearby values over time. The term ‘sustainability’ applies – will the project sustain it’s benefit as it ages?

Conventional Site Design

This development in Louisiana was planned in 2014, and it pretty much represents the typical residential subdivision as planned today. It was derived directly from the CAD file furnished by the engineer. It has 5,220 linear feet of street (one mile) that results in 91 lots. Given the configuration of the site using the regulatory ‘minimums’, everyone would naturally assume this is the only configuration that can work. In the end the developer is satisfied that this is the best design given the above confines.

The smallest lots are along the entrance, thus, ‘cheapening’ every home built in the larger lots towards the rear of the project. Each home will require 57 lineal feet of street at approximately $700 a linear feet (street, walks, utilities). The average hard cost will be $39,900 per home. This does not include raw cost of the land itself, the site grading and the required 4 acre detention ponding. If an engineer charges 7% of construction cost, the above simplistic plan represent about $3,000 per home sold in fees.

This site plan would take at most 2 hours to design using CAD technology using surveying geometry without a ‘subdivision design’ module. Given the current state of CAD automation, the design of the streets, utilities, and grading would perhaps take another day or two.
In 1960, a design this simple could consume weeks, if not months, of surveying, engineering, detailing, design, and drafting time. Today, this process takes just hours, or at worse a few days.

Ordinarily, no one would question the validity of the design itself. Well, the developer of this subdivision did question it and sought out a better solution...

The 21st Century Site Design

This plan was designed using the same regulatory minimums, the same building pads, the same restrictions in street width, and the same detention, but gained 8 lots with 1,220 feet less street length!

The developer (who was also the builder) desired to offer upscale housing but was restricted at the entrance by land that would only support small lots because of the width of the tract (to achieve a certain density goal to make the site financially viable). The developer could have used the minimum width lot throughout the site and achieved greater density, but their homes fit on both 75’ and 100+’ wide lots.

Since every home would be at the same 20’ front yard setback, the perception of space would be similar for both small and large lot – every home would remain exactly 90’ across - garage door to garage door, no matter what the width of the lot. The feeling of density is more influenced by front yard setback than lot width (the spacing between home fronts). The confines of the site dictated that the homes be at or close to the front yard minimums using conventional thinking creating a ‘garage-grove’ typical to the builder/developers competition (more on this later).
If the street length is 23.4% less, wouldn’t the density plummet? Absolutely – using conventional planning. However, density is not actually based upon street length. It’s actually a function of the lot width at the front yard setback. In conventional ‘thinking’ increased street length = increased number of lots (setback length). With 21st Century Site Design, we separate the street pattern and setback pattern, so that conventional thinking no longer applies.

A significant increase in the preception of space is created when setbacks meander aggressively which also increases density. Homes that are on an angle to the street soften or eliminates the garage-grove feel typical of suburban development. The elegant wide meandering walks invite a stroll and enhance value.
Numbers don’t lie ...

Assumptions (based on national averages, not current local pricing):

<table>
<thead>
<tr>
<th></th>
<th>Conventional</th>
<th>21st Century Site Design</th>
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<tbody>
<tr>
<td>Finished Lot Value:</td>
<td>$85,000 per home</td>
<td></td>
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<tr>
<td>Raw Land Cost:</td>
<td>$50,000 per qcre</td>
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<tr>
<td>Cost per Foot of Street</td>
<td>$700 per linear foot</td>
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<td>Raw land cost (40.18 acres)</td>
<td>$2,000,000</td>
<td>$2,000,000</td>
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<tr>
<td>Street &amp; Utilities</td>
<td>$3,654,000 (5,220 LF)</td>
<td>$2,799,300 (3,999 LF)</td>
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<tr>
<td>Misc. Site Grading &amp; detention</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
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<tr>
<td>Engineering</td>
<td>$326,000 (7% constr. Cost)</td>
<td>$396,000 (4,000 per lot)</td>
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<tr>
<td>Total</td>
<td>$6,980,000</td>
<td>$6,195,300</td>
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<tr>
<td>Cost per lot</td>
<td>$76,703 (91 lots)</td>
<td>$62,579 (99 lots)</td>
</tr>
<tr>
<td>Potential gain per lot</td>
<td>$8,297</td>
<td>$22,421</td>
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The above scenario introduces questions:

**Why are the engineering fees higher in the more advanced design?**

In the conventional plan, the engineer is the planner, who likely planned for free to secure the job. With the more advanced design either the engineer invested in better technology and education than possible using a CAD investment their competitors embrace or a separate land planner skilled in the new methods was hired. In the above example, our fees would have been approximately 10% of the $4,000/Lot fee.

A 7% of construction cost ‘fee structure’ rewards wasteful design. A ‘per lot’ or ‘flat’ fee structure is more logical, rewarding density gains and efficient design. Furthermore, significant additional savings in infrastructure and grading can be gained (not listed above) by coordinating planning and engineering to eliminate excess structures and storm drainage.
Paying for substandard design replicated by consultants using the exact same software and training is rewarding stagnation. Unfortunately those charging as a percentage of infrastructure costs are rewarded by designing in the most waste, intentional or not. New solutions intended to lower construction cost is aggressively fought against by many in the consulting industry. There are no winners other than the consultants who refuse to advance, and infrastructure contractors who increase their gross revenue.

Many developers hire consultants because of pricing or political advantages to assure quicker approvals, not because they expect the best possible designed development. This also explains why on a local basis most developments mimic each other - and again, no real progress has been made. ‘Local’ expands to ‘regional’ which expands to ‘national’ – resulting in no innovation in the world’s land development.

For example, storm sewer design in the conventional plan is mere button presses of a few functions automated in the consultants off-the-shelf-add-on CAD package. The consultant hired for 21st Century Site Design is educated in advanced design methods where most of the storm drain pipes could be replaced by nature’s surface flow. There is no button press (automation) for surface flow, thus significantly more effort (skill) is needed to reduce costs - potentially hundreds of thousands of dollars.

It is unfortunate that automation has been programmed to get plans out the door faster, not better! For decades universities have taught generations of CAD and GIS technicians to produce nothing better than those subdivisions designed in the days before Steve Jobs and Bill Gates were born. To make matters worse – CAD is a ‘one product does all’ tool servicing every industry needing a drafted plan. It just so happens that this jack-of-all trades is not a master for land development. For three decades consulting firms have devolved to a lower level of design. It’s time to reverse that trend.

A new age is emerging with consulting firms who posses the passion to advance site design by investing in a core technology and advanced training specifically created for land development to create wonderful places for people to dwell. Will they charge a premium? – absolutely. However, they will increase the fiscal benefit for the developer, builder, municipality, and resident far in excess of their additional fees!

Don’t other costs increase with the 21st Century Alternate?

Possibly. However the possible extra costs per lot, should not exceed the increase in revenue. More important is that the look and feel of the neighborhood is significantly improved.

Don’t the added walks and wide trails increase costs?

Most cities in the region require a 4’ wide walk each side of the street:

4 (walk width) X 2 (each side of street) X 5220 (street length) = 41,760 square feet in walks.

With this last example, there are 23,770 square feet of 5’ wide (more usable) elegant meandering walks, and 11,032 square feet in 8’ wide trail which is also used as alternate emergency vehicle access. The walks and wide trails consumes 17% less surface volume.
A typical conventional designed subdivision with curved streets can add significant time and effort to traverse a neighborhood.

**Don't winding streets add time in commuting?**

The curved street layout using these advanced planning methods have quite a bit of research and science to their logic. For example, most residents in the conventional design must contend with sharp curves, abrupt jogs, or stop and turns (flow cycles) to get home. In conventional planning, it is a ‘trend’ to add a roundabout or two to make a bland site plan drawing look more interesting – thus adding additional irritating roadblocks to the everyday commute. In this example, a single street defines the neighborhood, with adjoining streets designed to minimize distance to the entrance while maintaining flow, significantly reducing both time and energy!

**Significantly Greater ‘Intrinsic Value’**

This site is featureless (flat) thus any character must be *designed* into the site. While the lot width is 75’ wide, the actual homes that the builder will construct easily fits within the pad width. Since the existing minimums were held and all homes are built at varying angles to each other, the actual side yards (home to home) is much greater than in a conventional design (adhering to the same regulations). This is especially important in this example site, because this builder includes abundant side windows, thus more view of the adjacent open space, instead of the neighboring home’s private space.
The feeling of density will always be dictated by the area between home fronts. It is not enough to simply set every home at a constant deeper setback. Outside (along the street) distance is hardly noticeable, unlike inside a home where a ceiling height 1’ greater or a room width just 1’ larger can make a difference. There is quite a bit of art and science behind the rate of meandering or offset needed along a public street (or trail) to have the preception of space amplified (as seen above). The neighborhood feels more rural in character than suburban. While increased space will always have increased value, it is the space one ‘percieves’ that creates it’s value. The new planning methods can easily make 4 units per acre ‘feel’ more like 2 or 3 units per acre. Value increases in the same way a room, with a 10’ ceiling, has more value than an 8’ ceiling. This increased value will be maintained everytime the home resells, thus is ‘sustainable’.

Livability is an intrinsic value the 21st Century Neighborhood has over the conventional subdivided project. Monotony is abolished, and all of the homes have premium locations. Some builders charge premiums, while others spread value through all the lots. In either case, both home price (and tax base) justifiably increase while also reducing absorption rates (time to close a sale).

The conventional plan would have low function narrow walks built to meet minimums that few residents would actually use. The 21st Century Neighborhood has a pedestrian system that invites a stroll!

**Advantages to the Municipality**

In this last example the municipality is the big winner. Not only do they get a more attractive neighborhood, but their public infrastructure (streets and utilities) is almost 25% less than that of a conventional development without sacrificing emergency access! The maintenance costs to the city is likely to cost 1/4th of that compared to the conventional plan of the same density.

Most of these 21st Century neighborhoods maintain instead of increase density (this past example was an exception), the ‘value’ of the homes – thus the base for their property taxes will be higher, and are likely to increase at a higher rate than conventional housing. The city becomes financially sustainable.
The intrinsic value to the municipality comes in the form of setting a greater standard. In this particular example, there were other competing neighborhoods already in the approval process using these design methods. The developer/builder did not want to compete with the 21st Century Neighborhoods nearby and was heavily influenced by the desire to set an equal or higher standard. It is this new age of competition based upon higher design standards that will be of greatest benefit to the city. Mundane, monotonous cookie-cutter projects do not foster sustainable growth, unless the architectural and landscape detail is far above that of others. By significantly lowering development costs through design innovation it is possible to free-up funds that would have been otherwise placed underground, instead better architecture and landscaping ‘above ground’ – all without increasing home price!

Prefurbia

The collection of methods developed over 25 years (a few of which are introduced in this document) is explained in the book Prefurbia. It’s 4th Edition, is available through Amazon, rewritten to address the current ‘recovery state’ of the housing industry as well as including the very latest innovations in design methods of both land development and home building – single and multifamily.

Prefurbia provides solutions for commercial development, redevelopment, land use, and municipal regulations. The solutions have evolved, improved, and been refined on over 900 land developments of all sizes and forms in 46 States and 18 countries. The methods have demonstrated an average 25% reduction of infrastructure compared to conventional suburban design without losing density or reducing existing regulatory minimums. Compared to similar densities using New Urbanism, infrastructure reduction can easily exceed 40%.

Because no existing regulatory minimums are (typically) reduced, and are instead exceeded, the designs have enjoyed a 100% approval record (for neighborhoods we designed and presented).

Prefurbia represents a new era for neighborhood design, construction, and architecture that requires all involved: consultants, developer, and municipality to make an extra effort in order to create better communities for people to live, work and play. It also takes a different ‘consulting attitude’ for collaboration and to embrace design and technological changes and not simply be complacent.
Who is in Control?

Developers are thought to be in control of the world’s growth – or are they?

Developers rarely design their own projects – that is left to the consultant. For suburban development it’s likely that the local engineer or surveyor be in charge of the new subdivision plat.

The engineering or land surveying firm will most certainly offer land planning services because land planning is the first step to require their other services – it’s the ‘hook’ to land that profitable development project. This is also why many firms offer free site design as their bait.

If the project is urban or suburban, all consultants assume that the greater the number of units that they can cram into the site, the happier the land developer and/or builder client. This assumes the ONLY route to profitability is density. The project below maximizes density and infrastructure costs - lowering profits.

So how can they shoehorn the most possible units onto a tract? They have the municipal guidelines that clearly allow the most minimal in dimensions listed by a class of zoning that would apply to the land the developer wishes to build upon.

With the rules created by the planning consultant (in-house or hired) only minimal choices are provided. Why does the developer always get the blame, and not the design consultant, for the cookie-cutter mundane project? Why does the city (or their planning consultant) not get the blame for encouraging the minimal setbacks, square footages, and open space areas? Of course the developer could build to a higher standard than the minimum allowed, in the same way we could all volunteer to pay even higher taxes than due. Most consultants fear that intentionally losing density would lose their client (income).
Ultimately, while the consultant does take initial direction from the developer/builder, they (consultants) control the project more than any other involved in the process from start to finish.

The Regulations

The city’s minimal based system is also to blame. An alternate to a minimum based system being promoted by planning consultants is called ‘form based’ or ‘smart code’. The before and after example in the beginning would be impossible to build under ‘forms based’ or ‘smart code’ where only one choice is made for all future development. Also ‘forms based’ code guarantees the too familiar taste of the cookie-cutter recipe and the most possible infrastructure (and $$$ architectural detail) will get built.

While the developer takes on most of the financial risk, as we witnessed all too much in this past recession, they also hand over control to the design consultant, who have no risk in a failed or unprofitable venture. If they follow the regulations, how can they be blamed? Complacency certainly is not illegal.

Ultimately land developers need to be in the driver’s seat and if handing over the critical decisions to another, be sure that the consultant has the best skill, tools, and history of results, and not simply follow in the footsteps of their competition. Should the land developer demand better results, either the consultant must retool and educate, or simply have less business relenting to the consultant who invests to provide better results. You expect this from your doctor or attorney – why not the designer?

Technology Going in Reverse

In the 1980’s and 90’s if a consulting firm did not constantly change they would lose business to their competitors who could produce faster results. They were not necessarily better results, but faster. Since then, for almost two decades there has not been any material reason to change either technology or training. If anything, technology has dumbed down planning.

The proof is clearly seen in the demonstrations in the leading software supplier web sites:

http://www.autodesk.com/industry/civil-infrastructure/land-development-planning#.dynamic-filter-1

Then click the video labeled View Overview Video (2:31 min)

You will immediately see in their example a small subdivision under construction with double frontage lots wasting infrastructure. They go on to explain the benefits but show only cookie-cutter design – no attention to views from within the home, increasing connectivity & efficiency, reducing monotony, etc.

Another automated ‘planning’ technology just released by the second largest software player:

http://www.siteops.com/products/residential-layer/

Click on the 4 minute video. Again, in just 3 minutes you too can layout 162 lots, or about 1 lot per second.

In just 3 minutes they demonstrated a design of about $40 million dollars of construction, but what of increasing home values and providing better views from within the homes or curb appeal?
What effort was made to reduce infrastructure and replace expensive storm sewers with a system that could instead use surface flow?

Interestingly automated lotting similar to the above software from Real Projections and Eagle Point no longer seem to be offered on their websites.

In each case, all of these technologies were developed to make the subdivision platting process more automated, encouraging the designer to use a preset function and short-cut the planning process.

Over the past three decades it has become normal for consultants to rely on the software to think for them. For example, does the consultant take the time to work out geometry of an elegant meandering walkway, or simply press the automated function that parallels the curb with building setbacks that parallel the walks?

The Cost of Non-Collaboration

The surveying of a tract, land planning it, engineering of a ‘subdivision plat’, and the design of architecture involve 4 different talents. When Prefurbia was written, we researched universities across the nation and found that schools offering multiple degrees (architecture, planning, and engineering) did not teach a common ‘base’ or have assignments where students would work together on a common project. Instead they fostered the uncollaborative situation that plagues the design industry. If the land planner is providing a drawing with pastel colors and tree stamps to create a pretty picture, but ignores the physical restrictions of the site and shows increased density that is out of scale, (thus faking the numbers to please the client), it makes surveying and engineering the layout impossible. It also ultimately makes for enormous infrastructure and earthwork costs that would significantly cut into potential profits.

While working for planning, engineering, and surveying firms, designing thousands of developments, we only looked at the perimeter dimensions of a building, never the architectural floor plans or elevations. This is the ‘normal’ mode of the consulting business.

Architecture is often an afterthought. Without knowing the building elevations how can the planner possibly know what is the most pleasant side of the structure and design around it. Without knowing the floor plans, how can the planner know if the primary views from within the home are front or rear and if there are side view opportunities – all of which should influence the design? No wonder in 2015, the best alternative that has been touted has been to shoehorn homes along a tight grid as shown above. What are the view opportunities and connection to surrounding space for these residents? Duplicating the design standards of 1915 should not be the goal of 2015. Instead we would like to introduce you to a new collaborative design era where architecture, planning, engineering and surveying merge.
In order to advance land development industry we need to reset the industry to the mid-1970’s before software automation had it’s negative influence to replicate instead of add value.

To understand the possibilities of what can be done, the following are just a few examples...

The above image (from LandMentor) shows a pretty picture, but if we only look at planning as building perimeters and rooftops, we can only go so far with design...

By merging architecture (floor plan, living space, and windows) and planning (showcasing architecture and merging interior and adjacent exterior space), we add tremendous value and enhance livability. Each home (zero lot line design) above has panoramic views even though the units are just 22’ wide. By merging planning and architectural ‘systems’, we can advance the land development industry.
This ‘systems’ approach to design requires communication and collaboration at a level never before achieved in the typical development process. It also requires a much higher level of software technology than can be provided by current off-the-shelf CAD systems.

The first example reduced the street from 5,220 lineal feet to just 3,999 lineal feet. Instead of having the land dedicated to public right-of-way it goes into private ownership. In other words it’s like getting 105 acres use out of a 100 acre site. Can the same thing be made possible for architecture?

The above homes are on 45’ wide lots. They look as if they would be homes situated on 60’ wide lots significantly increasing curb appeal and home value. How is that even possible?
On non-rectangular lots, homes can be wider at the front if placed on the inside curves and wider at the rear of outside curves. Instead of placing a rectangle in a triangle, the planner and architect communicate as to what would be a constant side yard angle and develop floor plans. With this new era of planning where the setback meanders, all lots are designed as if along curved street, thus creating new design opportunities. What if we can also merge engineering decisions at beginning stages of design?

When there is a ‘common knowledge base’ and harnessing the proper technology at initial design stages, even the most difficult of sites can be designed more efficiently. Why wait until it’s too late to discover how much earth volume is needed?
Chicken or Egg?

What comes first - site planning or earthwork? On some tracts with steep slopes it may make more sense to sculpt the land in an attempt to create buildable pads and useable streets to obtain an initial rough earthwork balance before actually planning lots or setting the coordinate geometry.

To accomplish this level of planning the designer must grasp architecture (if architecture could be designed to interact with, instead of against, the natural slopes), but also a general knowledge base of civil engineering, site grading, and the precision of land surveying, again: 'a common knowledge base'.

For example the site below was designed by setting the base grades first:

An initial analysis using LandMentor reports exact cut and fills and also shows where the cuts and fills occur (and how deep) to provide an idea of ‘dirt’ moving distance. In this case LandMentor instantly provides a good starting point for the more experienced Civil Engineering professional to refine the grades in an attempt to reduce earth volumes. The ‘conventional’ route to design the development first and then have the engineer try to figure out how to make the design balance, is not realistic, as most developers know all too well on steep slope sites they have developed in the past.
The resulting site plan used modular homes with walkouts. Again, the above layout in 3D is part of the normal deliverables a developer could expect from a firm using LandMentor instead of a CAD or GIS based system – typically, without paying extra compared to the 1950’s site plan more typically delivered below:

Without a general knowledge base in all areas of site design, how can it be possible to possess the skills to advance site design beyond an ultra-simplistic 2D site plan most often delivered to the developer client and city used for public presentations?

The above plan typical of what would be expected today from any land planner, is no different than a plan produced in 1964, and not too much different than a 1914 site plan document. What if it was possible to develop a survey precise site plan, complete with all the critical information with just a little longer time than it takes to design and deliver the above ‘quick and dirty’ site plan? ... in both a 2D and interactive virtual 3D format?
The above example takes coordinate geometry for site design to a higher level than possible using CAD. If you can produce 3D easily in CAD you should be getting ALL your plans delivered in this format at no extra charge. You aren’t? Then the 20 years of promise for 3D from CAD vendors failed to materialize!

We do not live in a world of lines and arcs as shown on a CAD drawing. Our world is of physical surfaces, historically represented only by lines and arcs hand drawn on paper in the past, automatic today in CAD.
Look around you. How many lines and arcs do you see? None. You see surfaces and their edges. We have the technical power today to automatically define surfaces and drape them over the varying elevation surface of the land. Once physical surfaces are defined they can be tagged in many ways such as for environmental impact, costs, density projections, etc.

Thus, the surfaces become intelligent and can measure both environmental and economic impacts of a design at initial design stages to land surveying accuracy—instantly. This can be seen on the chart to the right which lists all the impacts on this redevelopment example, instantly and without extra effort in the design process, thus becomes free critical decision making information for the designer, the developer/builder, and the municipality!

This technological leap over CAD also allows views from within homes. How would it look like when built, or what the streetscape will appear as? How will surrounding buildings be impacted? For example, above you can see the shape of an existing church which becomes an attractive focal point even though it is several hundred feet from the sites north edge. Surrounding landforms and buildings can be an asset or liability, why wait till construction to discover which? What of shadows projected by existing or proposed structures that can block light (solar access)? That too is an automatic by-product with this new technology!

There are many software systems that specialize in financial analysis of land development, such as the Tract Pie series, planEASe, Investit, DealBuilder, and many more. The site plan itself contains a wealth of information, but was previously dissassociated from these financial analysis systems using CAD based software. What if the spatial intelligence of the site plan could directly tie into these specialized software systems? LandMentor can export spatial/financial data directly into Real Projections Land Pie, and into a general output format for the other systems to import. Why is this important?
It makes an awareness of the critical importance of the financial projections involved in the land development process that few of the 4 design professions would typically consider in the design process. By incorporating it into a singular solution we can teach these important aspects of site design into the ‘common knowledge base’. Again, without a common knowledge base how can the designer serve their clients with the best result? This common knowledge base must extend into the financial aspects of development and building, for land development as an industry to evolve.

**Virtual Reality - Communicating Site Design in the 21st Century**

What if you, as the client, could fly over and walk about the site interactively anywhere you wish without the time, money, or commitment of learning a CAD 3D system? Using Video Gaming technology instead of CAD allows everyone to quickly become an expert virtual presenter!

If your consultant is providing neighborhoods designed with far less infrastructure and of greater livability than the developers and builders you compete with, and deliver precision information in both 2D and interactive 3D already, at initial design stages, you can delete this document now.

Our challenge was to harness Video Gaming technology and not sacrifice engineering accuracy, while making the transition from site work (design, engineering, or planning) to 3D virtualization painless, with a minimum of time, learning curve, and effort. The goal was to provide a realistic picture that could not be spatially ‘faked’ or limited by a 3D video that only shows a preset location. An interactive Video Gaming Virtualization can be used by developers to sell their superior design for financing, approval and marketing, or by municipalities to clearly show the deficiencies of a bad proposal.

The virtualization can be in the form of a highly detailed realistic peek into the future importing 3D models from existing software as shown above, or for massing to highlight certain elements of the design. For example, the main trails (gold) and the major collectors (silver) on this 900 lot Master plan in Colombia are clearly seen better in three dimensions.
The client downloads the free LandMentor Virtual Viewer software and instructions on their own system in just minutes to ‘play’ their site in the same way as using video games. They can even use an X-BOX360 gaming controller instead of the computers keyboard.

Mentoring

LandMentor is NOT just software, but a new form of product – a mentoring solution.

To undertsand how this solution will make major positive impacts on the worlds land development, we need to go back in time...

...Being involved in both site design (since 1968) and software development (since 1976) specifically for land development provided a unique perspective that allowed us to reinvent technology and training in the form of a unique singular solution. Obviously software is not enough, if it were then the plats delivered to developers would not look as if they were designed 50 or 100 years ago. Yet, an education without the means to execute would also be useless.

We trained thousands of engineers and surveyors in classes and in their offices (as shown above in 1987) since the late 1970’s when the firm we founded, Land Innovation (a civil engineering software firm which was a two decade collaboration with Hewlett Packard) was formed. This provided a unique insight to the problems and challenges faced by site design professionals. Most of their challenges were due to both technological limitations and the dysfunction caused by the non-collaborative environment between the various design professions. For almost half a century we had a unique insight as to the consulting industry problems. We remain the only major software developer with a strong land planning background (instead of only engineering or surveying).

Rick Harrison Site Design Studio was formed as a spin-off from Land Innovation specifically as a think tank to discover new and better methods for site design, mapping, and land surveying. We have been unique – no other firm has brought more successful market proven innovations to benefit developers and builders, as well as municipalities and end users (those residing in these new neighborhoods), as we have – none. We are continually evolving and expanding research areas, but the future involves making our technology and discoveries available beyond our doors.
Creating a New Era

A decade ago we began spreading the knowledge beginning with the book Prefurbia. We cannot fix suburbia by simply attacking sprawl and forcing high density upon the suburban home buyer who values space. Prefurbia addresses problems facing developers and municipalities while introducing *market proven* solutions. The book has been updated 4 times since first published by Sustainable Land Development International to keep up with the latest innovations and changing economic conditions.

After publishing Prefurbia, the next stage was to develop technology that eliminated the long learning curve and limitations of a CAD or GIS based site design. It would have to be all inclusive and non-modular.

The goal: no longer than 3 days needed to learn the technology! This frees up time to teach the basics of surveying, engineering, architecture (and more) as it relates to land development, better site design methods, as well as the planning innovations of our design studio.

In other words, provide that critical *common knowledge base* currently missing in the industry, with minimal ‘down-time’. This *common knowledge base* is key to destroying the non-collaborative dysfunction that holds the entire land development industry hostage to advancement.

By teaching critical information not currently taught in any university (but should be) architects and planners will recognize their negative impact on surveying and engineering and take action, or an engineer or surveyor can understand the value of home placement for better curb appeal with increased views. Over time existing barriers preventing great design dissipate. Everyone involved in site design must fully understand ramifications of the layout both in terms of economics and living standards.

**Commitment**

With the simplistic ‘minimums based’ level of design used in a typical subdivision or new urban design, learning to design a project housing thousands of residents is easier than learning to drive a car. What if you wanted to learn how to fly, so you could just take off to one of the 15,000 airports spread throughout our nation? It would take commitment. What if you wanted to learn to fly safely in adverse weather? Even more commitment.

Conventional subdividing land, like driving a car - almost anyone can quickly master it. Perhaps this is why there are *no requirements or licensing* needed to become a ‘land planner’, only a business card stating you are! To create more efficient neighborhoods of *higher value and less construction costs*, that are safer, with direct pedestrian connectivity enhancing vehicular flow, and expanding architectural spaces that blend with adjacent open spaces... *takes a greater level of commitment*. To learn the multiple aspects of site design (architecture, engineering, surveying, planning, finance, etc.) takes commitment.
A prepackaged CAD based software solution with only instructions how to use it’s functions cannot foster progress, just complacency. Installing the latest software cannot make a better user, it that was the case, our world would be far more attractive, affordable and sustainable.

For a solution to make a difference it must take on a higher level of commitment for the user (architect, engineer, surveyor, or planner) and a singular non-modular all-inclusive solution with training and ongoing mentoring. No product has ever been marketed this way... until now.

This system called LandMentor is now available on a limited regional basis to consultants who can demonstrate their desire to advance the land development industry and serve their clients (you) better. If a consultant has the LandMentor System, they have committed the time and training and invested to serve you better. They are the only firms privy to the exclusive methods and techniques developed by: Rick Harrison Site Design Studio. LandMentor will not be available in the general marketplace to design firms until 2017.

It’s 2015 – shouldn’t the next development being designed advance the land development industry?

The LandMentor System is not limited to just consultants and government entities, but also a great way for Land Developers to gain the knowledge to make better decisions!

If you want to understand more in a technical basis why LandMentor represents a better (disruptive) core technology, see:

www.rhdsplanning.com/POBintroduction.pdf

CONCLUSION

For thousands of years our world has been planned by laying out the streets then the lots – everything else (curb appeal, livability, views, environmental impact, connectivity, etc.) was an afterthought.

The technological advancements in both office and field has failed to introduce any innovation in planning, civil engineering, and architecture – only land surveying has demonstrated a significant improvement.

Only the land developers, builders, and municipalities can force change by demanding it from their consultants who should be embracing it. Will 2015 emulate 1955 or look to 2055? That’s your call.
Until now the only way to get the design benefits presented in this document was to contract with our land planning studio (www.rhsdplanning.com).

Today we are partnering with consulting firms dedicated to providing the best services in the industry.

Today these LandMentor Consultants include:

Short Elliot & Hendrickson (Minnesota, North Dakota, Wisconsin, Colorado, Texas, and more)

Landmark Engineering (Northern Illinois, Eastern Iowa)

Soon:

BSE Consulting (Central Florida)

Beta Users include: Moore Engineering (Fargo, ND) & Calibre Engineering (Denver, CO)

Land Development Financial Projection software credits include Skip Preble (skip@landanalytics.com) and Tract Pie (www.Tract-pie.com)

LandMentor translates DXF, DWG, SHP, Rw5, DAE, and Cr5 data formats.

For more information to discuss how this new era of design and technology will benefit you, call:

Rick Harrison Site Design Studio (Planning): 763-595-0055

Neighborhood Innovations, LLC (LandMentor): 763-545-0216

Or E-Mail rharrison@rhsdplanning.com

Additional Resources:

You Tube

LandMentor Site Design Advantages, 2 minutes: https://www.youtube.com/watch?v=HGds-3hKIQU

Landmentor Surveying Advantages, 3 ½ minutes: https://www.youtube.com/watch?v=bDzmTAukosE

LandMentor Engineering Advantages, 1 minute: https://www.youtube.com/watch?v=dbOLKOUsF6M

LandMentor Municipal Advantages, 4 minutes: https://www.youtube.com/watch?v=bU4Q3cvAtXk

Prefurbia Short Overview, 3 ½ minutes: https://www.youtube.com/watch?v=P1SV1zAKq04

Prefurbia more Comprehensive, 24 minutes: https://www.youtube.com/watch?v=trC-HrVgJ38

Prefurbia for Redevelopment, 26 minutes: https://www.youtube.com/watch?v=FPMVdNJIMjo

3D Examples – Sketchup

SketchUp 3D Warehouse, Search Prefurbia: There are 125 neighborhoods you can download!

LandMentor software holds several US Patents.
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