Opening slide, while waiting to start

- make sure this is the talk that attendees were expecting to watch.

I'll be speaking over this before switching to my camera

Transition slide. I'll stop sharing, and speak on camera

- Welcome to Bricks by the Bay 2020 Virtual Conference

(What are we calling it, officially?)

Who am I?

- Co-founder of BayLUG (1998) and BayLTC (2000)

- The guy usually in tie-dye…

- I really like blinky lights, and try to put them in my MoCs.

- I also tinker with Arduinos, and I've built that into my MoCs as well

How we'll handle questions

- There will be a few topics in the talk.
- Each topic will have a few questions at the END of the topic…
- Please type your questions into the "**Q&A**" tab. (The moderator may reply by typing, or will pick some to be answered during each Q&A portion.)
- We will have a general Q&A at the end.

Why am I leading this talk?

I've modeled Micropolis for 5+ years

Why am I giving this presentation?

- I like Micropolis. I've been modeling it for 5+ years

This is my "Bus Barn". It's modeled after the Downtown Transit Terminal in Stockton, California.

It's built on a "Micropolis 2" base, with arch bricks allowing power cables to be run under the modules.

There is an Arduino Pro Mini mounted underneath, to run two small LEDs under the awning in the Bus Loading area. They lite

occasionally to tell riders when a bus is ready to depart.

There are simple LEDs lighting the inside of the building.

There are four digital clock tiles mounted at the roofline. Each has two small red LEDs to backlight the tiles when the room is dark.

Why am I leading this talk?

I really like trains.
I'm a Brakeman.
For 13+ years…
Niles Canyon Ry.
It's a real train,
it was a rainy day,
and I fixed things.
And I can speak confidently in public!

Why am I giving this presentation?

- I like Micropolis. I've been modeling it for 5+ years

- I like trains, and I've been a Brakeman at a railroad museum for 13 years

Niles Canyon Railway

URL >> https://www.ncry.org

This was a rainy day, and the train was heading to pick up 400+ passengers, when I noticed something dragging. It was an electrical cord, and it would need to be tied up safely before we could leave. I called the train to a stop, and the two electricians came to look at it. (I'm also trained as an electrician.) When they got on their hands and knees, they saw the problem, and agreed that it needed to be fixed. Then they stood up, and looked at me. And stood there.

I'll just say that I was the smallest of the three electricians, and the other brakemen didn't want to handle wires under a train, so I volunteered for THAT job as well. At least someone thought to take a photo while I was under the train.

Can we handle Q&A like this?

I'll be bouncing between speaking on camera, running my computer, and showing you LEGO creations…

Please type your questions in the Q&A. My moderator will keep track of them, and we'll address them from time to time as the talk rolls along.

The first part will move quickly

My slide deck will be available online.

I put most of the information that I'll be speaking about in the "Speaker's Notes" section of the presentation, including any other URLs that I'll be mentioning.

I need to find a place to post my slides.

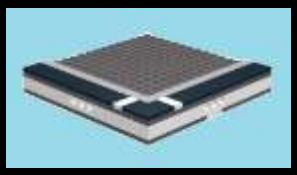
If I don't cover things in the talk, and you'd like to ask me later, please email zonker@ncry.org

I came up with "Micropolis 2" as a follow-up to the TwinLUG "Standard" block design, so that we could run a 5-v power feeder cable under the modules, so that one power pack could light many modules. (Getting outlets at a conference display table can be hard. Getting more than a few is also hard, since Fire Marshalls really discourage power strips on the floor.) Partly it was filling a selfish need, to light *my* MoCs, but I'm happy if others can benefit from my efforts. But it helps me if others modify their bases, so the wire's can go under their MoCs to reach mine.

URL >> http://micropolis2.pbworks.com

What is Micropolis

It's a 16x16 block.
Streets and sidewalk on two sides.
Technic pins will connect the blocks.



Most of you will already have a good idea about Micropolis, but I expect we'll have a few beginners in the group. I don't want to leave them behind early in the talk, so I'll build a quick idea if the origins and the block standard before moving on…

URL >> **http://twinlug.com/micropolis-micro-city-standard/**

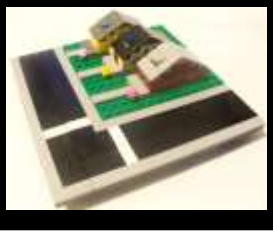
URL >> **http://twinlug.com/micropolis-micro-city-standard/micropolis-v1-1-bluff/**

URL >> **http://twinlug.com/micropolis-micro-**

city-standard/micropolis-v1-1-waterfront/

A few words about scale

- How big is a 1x1 plate in Micropolis?
  Generally, 7.5' x 7.5' x 3' tall
  For trains, I use 10' x 10' x 4'
- But you can build bigger or smaller and use that to "force perspective"



The original scale is "suggested". When you're working at such a tiny scale, a basic car is usually 1x2 for the body, and 2-3 plates tall. And that first plate is usually a 1x2 jumper plate.

You can build for a bit more detail, and the basic building might look "closer". To make a larger building, you adjust the scale a bit. But the bases are still the same size.

When we get together at a meeting or a conference, we'll bring our models, and put those "close-up" models in front, and the larger buildings around the sides, or towards the back. This helps "force the perspective" of the viewers, making the layout look much larger! (So, it's a Good Thing to have MOCs with varied scale…)

Not the streets on the module on the right! They added an "Edge" trim piece, to hide the parts used to build the base.

Intro to Micropolis Scale

Micropolis is quick, easy, fun

- Start with one module, share at your club.
- Connect to modules from other members.

A Micropolis quarter-block is 16 x 16 studs. It's a plate, on a brick, on a plate, and then you build on top of that.

It's easy to store and move! You can fit two quarter-blocks into a 6-quart storage tub (which also keeps dust off, AND if the model falls apart while moving it, you still have all the parts in one place!

The technic pins help align the modules, and keep them level, and hold them to each other. (Sometimes meeting room or conference tables are not very level, and the pins help the modules become a "fabric" of bricks, so the city looks

smooth.)

URL >>
https://www.brickpile.com/2017/11/22/baylug-september-2017-meeting/ **a small layout.**

This image on the slide is an example of a LARGE display, with modules from many conference attendees. I found that having my own 3-5 modules was "enough" for me, but then I'd go to Brick by the Bay, and be inspired by many modules that others had built.

If your club meetings or conference has any chance to buy "bulk brick" (used LEGO), that's a good time to use that newfound inspiration to look for the bricks and plates that you wish you had at home, so you can get started on your next models as soon as you get home! Some folks even build new modules at the conference!

Use the standard if you can

- Cities don't have sidewalks everywhere
- The position of the crosswalk matters

All these crosswalks line up!

The original crosswalk was a diagonal-striped 1x2 tile from the old LEGO Studios series. But they were hard to find, and the "standard" adopted the 1x2 white tile instead.

Some folks will use older light-grey for their sidewalk, while others may only have newer light-bley. Maybe you need to mix, because you don't have enough of one color. THAT DOESN"T MATTER! ☺ Sidewalks get repaired, and some parts look different from the old color.

Some neighborhoods don't have sidewalks. But, if you're building for "downtown", you should add the sidewalk.

Put large scale in front!

Consider the perspective of the layout shown here.

- Where are the bigger buildings?

- Where are the “close-up” MOCs?

- Do the sidewalks line up?

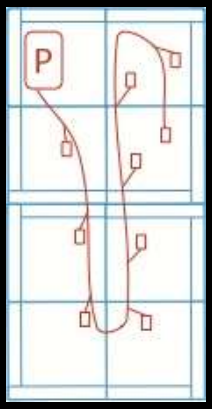
Do you see a block that inspires you to try to make something like it?

Questions about Micropolis?

- Up next, Micropolis 2.
- After that, we'll get on the Trains.

Why is there Micropolis 2?

- That's on me. To run power under MOCs.



The original Micropolis bases have a solid bottom plate layer. If I wanted to run power to my modules, I was relegated to the sides or the back edge of the displays. If I wasn't near a power outlet, sometimes I'd have to display on another table, or have no power to the MoC. I thought "There MUST be a better way!"

I found small, polarized connectors that folks could find at Radio Shack or Fry's Electronics. Sadly, both are now defunct, but the parts are still available from DIGIKEY, and other hobby-electronic websites, and they will ship them to you!

URL >> http://micropolis2.pbworks.com/w/page/84913972/Power%20Connections

URL >> https://www.digikey.com/product-detail/en/molex/0766500063/23-0766500063-ND/2115916

The 1x4 arch bricks make it easy to hold your module with one hand, and connect the cable with your other hand, and then set the module down on the table. I use the technic pegs with the short-stud on one side to join my modules to others.

Spread the word! You need more Arch bricks for Micropolis 2, but you don't need so many plates underneath!

Why is there Micropolis 2?

- Taking models back and forth to meetings (Micropolis cities are different each time)

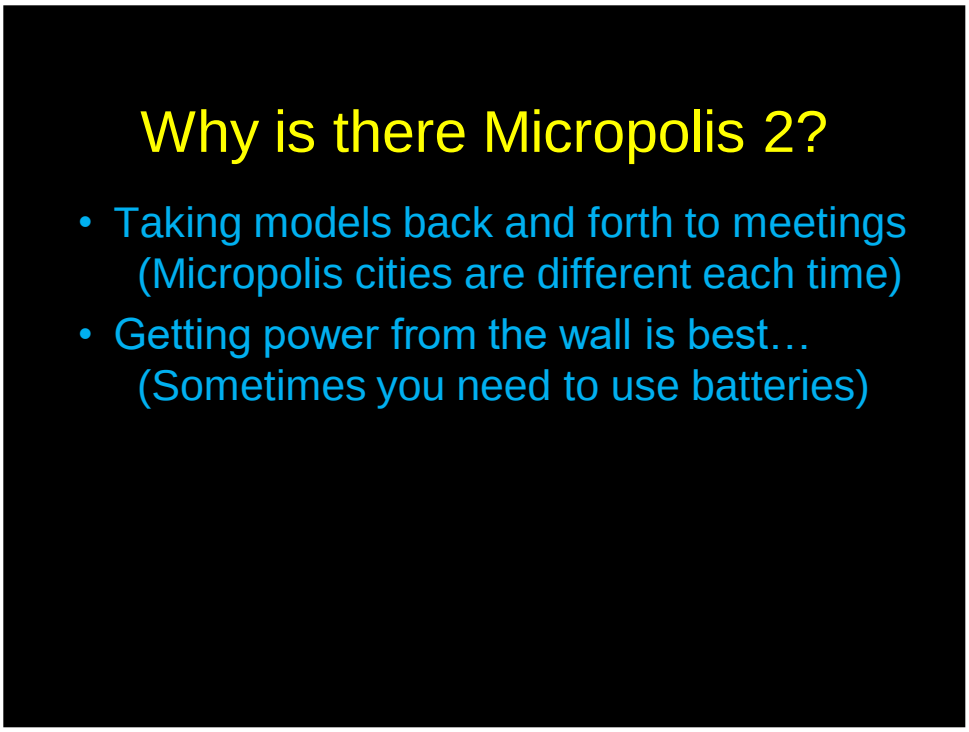
The original Micropolis bases have a solid bottom plate layer. If I wanted to run power to my modules, I was relegated to the sides or the back edge of the displays. If I wasn't near a power outlet, sometimes I'd have to display on another table, or have no power to the MoC. I thought "There MUST be a better way!"

Being able to lay out a power harness that can supply power to a few, o to many MOCs, the lit MOCs can be put into one area of the display and run all those MOCs from a single power drop. Then you can bring in a MOC, connect it to power, and just set it down, with the wires passing under the arch bricks. When the display is done, it's

easy to pick up your MOC, disconnect power, and pack up.

Using 5-volt DC power is preferable to using 12'v or 9v battery packs.

- **Changing batteries on MOCs in the middle of a display is hard and disruptive.**
- **USB power packs are ubiquitous (we all have many of them)**
- **Mini-LED strings usually use 4.5v battery sources, and are easy to adapt to 5-volt power**
- **If you cannot us the USB power pack (not close to an outlet?), use a big USB battery pack for the day, and recharge at night.**



The original Micropolis bases have a solid bottom plate layer. If I wanted to run power to my modules, I was relegated to the sides or the back edge of the displays. If I wasn't near a power outlet, sometimes I'd have to display on another table, or have no power to the MoC. I thought "There MUST be a better way!"

Being able to lay out a power harness that can supply power to a few, o to many MOCs, the lit MOCs can be put into one area of the display and run all those MOCs from a single power drop. Then you can bring in a MOC, connect it to power, and just set it down, with the wires passing under the arch bricks. When the display is done, it's

easy to pick up your MOC, disconnect power, and pack up.

Using 5-volt DC power is preferable to using 12’v or 9v battery packs.

- **Changing batteries on MOCs in the middle of a display is hard and disruptive.**
- **USB power packs are ubiquitous (we all have many of them)**
- **Mini-LED strings usually use 4.5v battery sources, and are easy to adapt to 5-volt power**
- **If you cannot us the USB power pack (not close to an outlet?), use a big USB battery pack for the day, and recharge at night.**

Why is there Micropolis 2?

- Taking models back and forth to meetings (Micropolis cities are different each time)
- Getting power from the wall is best… (Sometimes you need to use batteries)
- USB power packs can charge overnight so your USB battery pack can run your MOCs all day…

The original Micropolis bases have a solid bottom plate layer. If I wanted to run power to my modules, I was relegated to the sides or the back edge of the displays. If I wasn't near a power outlet, sometimes I'd have to display on another table, or have no power to the MoC. I thought "There MUST be a better way!"

Being able to lay out a power harness that can supply power to a few, o to many MOCs, the lit MOCs can be put into one area of the display and run all those MOCs from a single power drop. Then you can bring in a MOC, connect it to power, and just set it down, with the wires passing under the arch bricks. When the display is done, it's

easy to pick up your MOC, disconnect power, and pack up.

Using 5-volt DC power is preferable to using 12’v or 9v battery packs.

- **Changing batteries on MOCs in the middle of a display is hard and disruptive.**
- **USB power packs are ubiquitous (we all have many of them)**
- **Mini-LED strings usually use 4.5v battery sources, and are easy to adapt to 5-volt power**
- **If you cannot us the USB power pack (not close to an outlet?), use a big USB battery pack for the day, and recharge at night.**

Why is there Micropolis 2?

- Taking models back and forth to meetings (Micropolis cities are different each time)
- Getting power from the wall is best… (Sometimes you need to use batteries)
- USB power packs can charge overnight so your USB battery pack can run your MOCs all day…
- It's about using 1x4 Arch Bricks.

The original Micropolis bases have a solid bottom plate layer. If I wanted to run power to my modules, I was relegated to the sides or the back edge of the displays. If I wasn't near a power outlet, sometimes I'd have to display on another table, or have no power to the MoC. I thought "There MUST be a better way!"

Being able to lay out a power harness that can supply power to a few, o to many MOCs, the lit MOCs can be put into one area of the display and run all those MOCs from a single power drop. Then you can bring in a MOC, connect it to power, and just set it down, with the wires passing under the arch bricks. When the display is done, it's

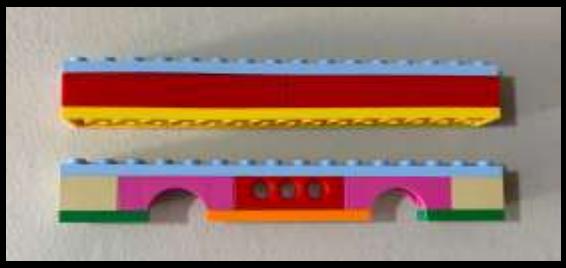
easy to pick up your MOC, disconnect power, and pack up.

Using 5-volt DC power is preferable to using 12’v or 9v battery packs.

- **Changing batteries on MOCs in the middle of a display is hard and disruptive.**
- **USB power packs are ubiquitous (we all have many of them)**
- **Mini-LED strings usually use 4.5v battery sources, and are easy to adapt to 5-volt power**
- **If you cannot us the USB power pack (not close to an outlet?), use a big USB battery pack for the day, and recharge at night.**

Build on a strong foundation

- The same height (plate – brick – plate)
- Use Technic bricks/pegs to connect them.



Whether building Micropolis or Micropolis 2, you'll put a set of plates on top…

If you want to use power, use Arch Bricks and leave a gap on the top plates for your wires to come up…

Then you'll build your MOC on top of the plates.

You'll add your streets, crosswalks, and sidewalks.

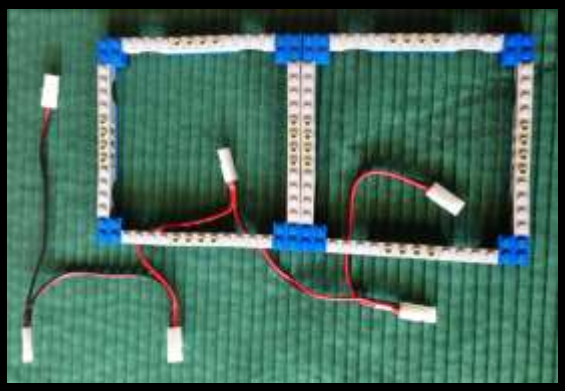
If you don't have larger (8-wide) plates, you may have a few junctions (or many junctions) to support the plates from below, so that you can press down as you build upward. They don't have to be permanent, but they WILL make your base sturdy, and that makes building your MOC easier!

For Micropolis 2, the more supports you have under that top plate, the harder it is to sit your model flat when there is a power cable going underneath. Once your MOC is built, see if you can remove some of those support bricks and plates. Is the top plate and your MOC sturdy enough? I think you might be surprised!

The base layers aren't visible, once the city starts to come together, so you can use any colors you like. For my Micropolis 2 base design pictures, I decided to use a different color for each type of piece, so that it would be easy to see how the parts go together.

Power to the MOCs!

- One power source for many MOCs



The Arch Bricks are the key that allow us to bring a MOC late, and quickly and easily drop it into the space left for us.

The Arch Bricks let us take our MOC out when we want to pack up, without disrupting others.

The power harness running under many MOCs makes it easy to run a display from a single power source. The number of drops you use on your power cable is up to you. More MOCs will want more current, so consider that when choosing the wire gauge and the number of drops.

- **I find #26 or #24 to be the right size, trading off**

between current-carrying capacity and being flexible to handle.

Since most MOCs will use LEDs, and some may use an embedded computer (Arduino, PIC, etc.), it's important that the power connectors be polarized, to reduce the chance of damaging the electronics! Please read

http://micropolis2.pbworks.com/Power%20Connections so that all our power connections are wired the same!

Where do the wires come up?

- It's easy to thread a string of tiny LEDs up through a Technic plate hole.

- Or leave a 2x2 plate hole somewhere.

The Arch Bricks are the key that allow us to bring a MOC late, and quickly and easily drop it into the space left for us.

The Arch Bricks let us take our MOC out when we want to pack up, without disrupting others.

The power harness running under many MOCs makes it easy to run a display from a single power source.

Since most MOCs will use LEDs, and some may use an embedded computer (Arduino, PIC, etc.), it's important that the power conectors be

polarized, to reduce the chance of damaging the electronics! Please read

http://micropolis2.pbworks.com/Power%20Connections so that all our power connections are wired the same!

Where do the wires come up?

- Make sure that your support plates and bricks don't block holes for your wires!

I usually use 2x2 brick and plate combinations for supporting top-plate junctions. Sometimes a 2x4 plate and brick combination, if the junctions don't line up directly.

A key here is to use as few supporting parts underneath as you can on your final design, since they may make it hard to sit the MOC down on the power harness.

Once your MOC is built on top, see if you can safely remove some of those support bricks. You'll probably find that the model on top gives you plenty of stiffness, and distributes pressure across all of the top plates.

Where do the wires come up?

- Power for the LEDs for my Fire Station

Fire Station details;

- This is a simple string of LEDs, cut from a string of battery-operated "LED Micro Lights" that I found at Big Lots after Christmas.

(50 Warm White LEDs on tiny insulated wires, using 3 AA batteries for power…)

(The three-batteries part is important! That means the string will run on 4.5 volts…)

- Where the red/black wires join the string of "Micro Lights", I've added a standard silicon diode for protection…

(The diode will drop the 5-volt power down to 4.4 volts, which protects our LEDs from over-voltage AND reversed-polarity.)

- These LEDs are about the size of sesame

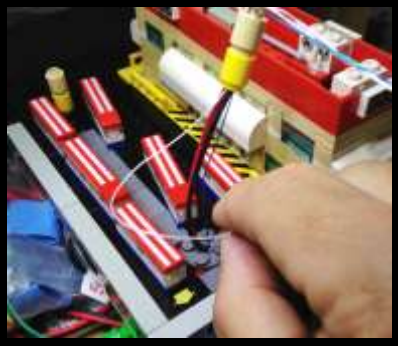
seeds, and the string is just threaded up through a Technic Plate hole

To position the LEDs, I get them close to where I want them, carefully separate the two wires (in between two LEDs), and straddle them over a stud, and then hold them there using a 1x1 square plate turned in place to anchor the wires.

I do that while running power on the string, to make sure that I don’t break the wires, or cause a short-circuit.

Where do the wires come up?

- Power for the LEDs for my Bus Barn



Bus Barn details;

- There is a 1x2 digital clock tile on each side of the red parapet wall on the main building
(The are mounted to a pair of older Headlight Bricks, with two red LEDs entering the bricks from the rear)

- There are a few white LEDs in the main building, lighting the windows of both floors.

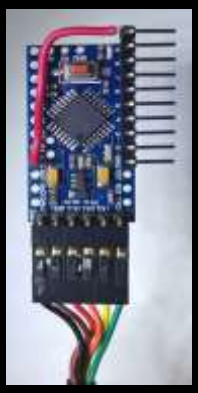
- The Awning above the loading area has a string of white LEDs, AND two yellow LEDs…
(The white wires are for the yellow LEDs. The black is a common ground, and red is for the white LEDs)

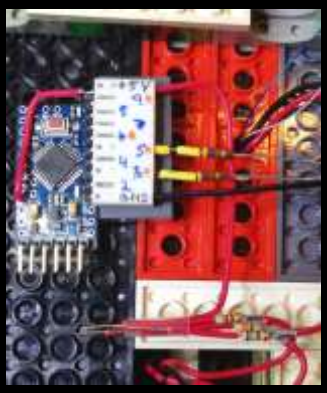
- There is an Arduino Pro Mini under the model, and it's only job is to randomly pick intervals to

determine when to fade the yellow LEDs up and down (to indicate that “This bus is Now Boarding.” and then pick a new interval (for each LED, independently).

Where do the wires come up?

- Underneath my Bus Barn…





Bus Barn underside details;

- on the left is the Arduino Pro Mini (About the size of a "LOVE" Forever stamp) connected to my computer

(It's only job is to randomly pick intervals to determine when to fade the yellow LEDs up and down)

(You can see that is has many other input/output pins that could be used…)

- In the middle is a connector for the Arduino Pro Mini, kragled to an inverted 2x2 tile piece.

(This lets me remove the Arduino for reprogramming, or for replacement if an output dies.)

(The tile piece anchors the connector securely, so that wires won't flex, to help make it reliable.)

- On the right, you can see the white connector block, mounted to the top-plate, and all the wires!

(The two yellow stripes are insulation on resistor leads (one for each yellow "Boarding" LED)

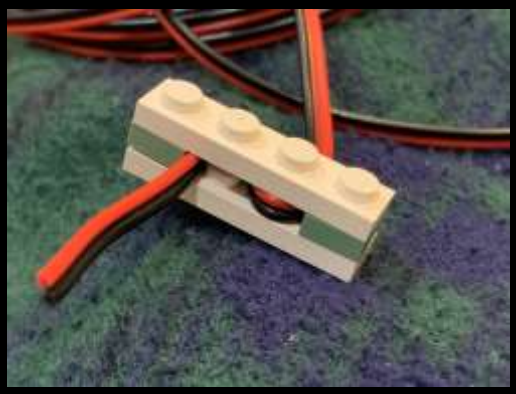
(You can see the wires coming from the "Boarding Area Awning" coming down through a hole.)

(At the bottom, near white plates, you see wires and resistors for all the LEDs in the main building.)

- This photo was taken while I was doing the final testing, before I connected the main power connector leads.

How do you anchor the wires?

- Here's how I keep them in place



This works well with #26 auge 2-conductor wire. You can do it with #24, but you'll need to stack two 1x1 plates on each end.

These 1x4 assemblies can then sit near a corner under your module, where you can easily find that cable with a finger while you are holding the module with one hand (and using the other hand to get the power connector on the power harness cable on the layout).

1x2 or 1x4 Technic Bricks?

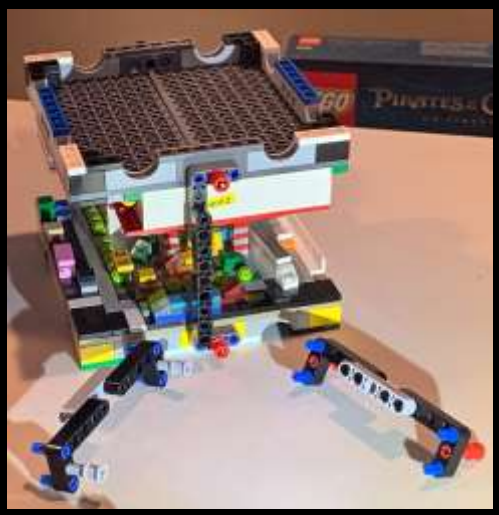
- In practice, we only use that center hole to align and connect modules at shows.
- BUT, using 1x4 allows you to stack your modules for storage and transport!
- All my new MOCs will use 1x4 Technic and 1x4 Arch Bricks.
- It's easy to change them later!

I originally started with the 1x2 Technic brick after early Micropolis module building, and using them to connect modules at club meetings and public displays. Because they worked fine, I collected a bunch of them when I picked through used brick piles.

Then I made "Micropolis 2 base kits", for club members to use to get started (because it would be easier to run power under the display if more members had arch bricks, even if they were not connecting to the power). This used most of my 1x2 Technic bricks, and I started to use the 1x4 parts instead, since they fit well.

Recently, I looked at how much volume (space) is left in my storage bins, since most of my Micropolis MOCs are not very tall. And I wondered if I could stack two of them, using other Technic parts…

Stacking your MOCs!



Using the 1x4 Technic Bricks lets you attach other Technic parts with multiple pins, making them a sturdy structure.

Putting a bracket on two opposite sides can allow you to stack your modules for easier, more stable transportation.

This is an example that works for a couple of my MOCs, allowing me to put three into a tub instead of two.

The structures will need to fit with your own modules. It depends what you have on the roads, and whether you have an alley behind your building. If you have stuff right at the edge of the module, your brace will have to be built on the "Away-side" of the brace.

Questions about Micropolis2?

- Up next, Micropolis Trains!

What's missing in your city?

If your club sets up Micropolis at meetings, think about what people HAVEN'T made!

- Our layouts didn't have trains…

If you need inspiration, check out;

- Facebook Micropolis group
- Search photo sites for "LEGO Micropolis"

Early in my Micropolis building days, there were MANY images posted on the Internet. They helped me understand the scale better (because some were larger and smaller…), and then the large displays looked amazing! I was hooked!

Think about what's missing in the city you are building, and then try to build that. ☺

- **Police Dept? Fire Station? Hospital?**
- **Downtown? High-rise? Apartments? Big Box Store? Small Mall? Office complex?**
- **Urban? Suburbs? Rural? Farm?**
- **Maybe a landmark? Maybe a little park?**
- **Water features! A river? A shoreline? A lake? A community pool?**

There are plenty of images on the web now, if you need more inspiration.

There are Canal modules!

- www.little.brickroot.com/tag/micropolis/

Christian Benito is a member of PortLUG, and a prolific builder, often with a new MOC on "Micropolis Monday".

BayLUG member Bill Ward (brickpile.com) was inspired by these designs, and built some Canal modules to bring to collaborative builds.

Look at his larger collection with the tag "micropolis"

https://www.little.brickroot.com/tag/micropolis/

You can find his river modules with the tag "canal"

https://www.little.brickroot.com/tag/canal/

- **Facebook https://www.facebook.com/littlebrickroot/**
- **Instagram https://www.instagram.com/brick_root/**
- **Twitter https://twitter.com/brick_root**

There are Canal modules!

And you can stack them, too!

Christian is a member of PortLUG, and a prolific builder, often with a new MOC on “Micropolis Monday”.

BayLUG member Bill Ward (brickpile.com) was inspired by these designs, and built some Canal modules to bring to collaborative builds.

Look at his larger collection with the tag “micropolis”

https://www.little.brickroot.com/tag/micropolis/

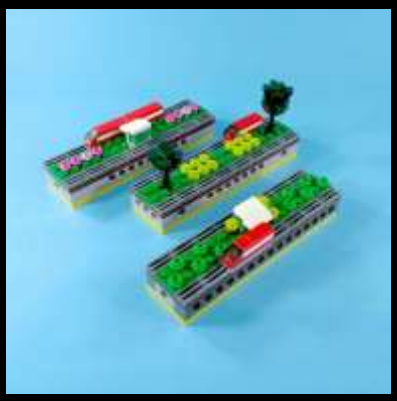
You can find his river modules with the tag “canal”

https://www.little.brickroot.com/tag/canal/

- **Facebook** **https://www.facebook.com/littlebrickroot/**
- **Instagram** **https://www.instagram.com/brick_root/**
- **Twitter** **https://twitter.com/brick_root**

There were some trains…

- Some folks tried making tiny trains…
- Some tried to add urban trains
- But they shifted the block format…



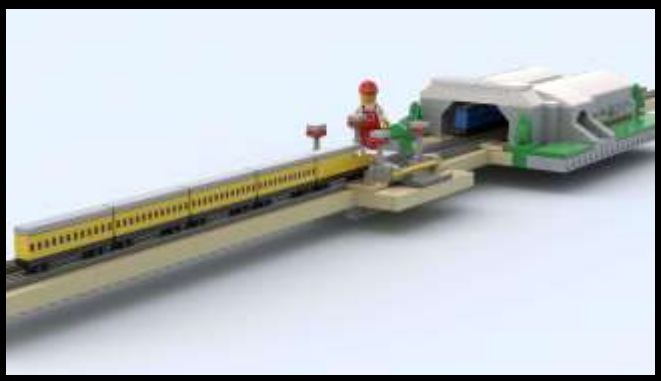
There were a few attempts to make tiny trains. But the scale was inconsistent.

Some attempts to have urban trains/tolleys were 4-, 6-studs wide, but were short modules, and caused the streets to be spread farther apart where the trains ran through. In the example here, the trains crossing the roads was an experiment left to someone else…

But some of them were using the 3-grill 1x2 tiles, and it looked good to me. But the trains didn't. I wanted whels, but there weren't any good LEGO parts that small to do the job.

There were some trains…

- Some trains were stand-alone MOCs



This model used the 3-grill tiles… done as a minifig-scale model railroad.

But, WAIT A MINUTE! What part was he using for the wheels?!?

There were some trains…

- Some trains were stand-alone MOCs

This model used the 3-grill tiles… done as a minifig-scale model railroad.

But, WAIT A MINUTE! What part was he using for the wheels?!?

The cars were ALMOST touching, but not quite…

That gap certainly wasn't a ½-stud offset!

The windows must be labels, since I haven't seen that printing on a brick like that…

Was that even a LEGO part?

It may have been a LGEO rollerskate… but if it was, it was modified!

Then Bill Ward brought THIS!

BayLUG member Bill Ward (brickpile.com) inspired me with his big "Third-Rail train modules". It looks like our local BART (Bay Area Rapid Transit), but had no visible wheels. I wanted to make a Freight Train equivalent!

The main station (parking below, station platform above) is two-blocks large, but the tracks are 4 studs wide, and extend in two directions… so he's built his block modules under the station to be 36-studs wide (instead of 32).

His track modules then split other half-blocks for two blocks (64 studs) until the tracks "go underground , in two directions from the station! But what then? He needed to make extra "green space" 4 x 32 modules with road on the skinny ends in order to help keep the streets aligned.

Then Bill Ward brought THIS!

- Main Station (2 blocks) (4 studs wider)
- Track declines (4-studs wide) (2 blocks on each side of the station.)

BayLUG member Bill Ward (brickpile.com) inspired me with his big "Third-Rail train modules"

The main station (parking below, station platform above) is large, but the tracks are 4 studs wide, and extend in two directions… so he's built track modules to expland blocks until the tracks "go underground (two more blocks in each direction!), but what then? He needed to make extra "green space" 4 x 32 modules to help keep the streets aligned.

Then Bill Ward brought THIS!

BayLUG member Bill Ward (brickpile.com) inspired me with his big "Third-Rail train modules"

This picture shows one end of the train station, with still-elevated tracks, above the 4-stud wide track modules.

On either side of the track are one of my Micropolis2 half-blocks, but the track modules left no way to get power to the Bus Barn MOC.

Just behind my Micropolis2 MOCs are some of Bill's "Canal Modules" based on a design by Christian Benito of PortLUG. The water level is a table level, so there wasn't a way for power to get across the canal, either.

BUT, it's by getting many MOCs together like this that ideas are born, when many good builders see the puzzle, and discuss alternative solutions. This summer, I'll try to make a Rail Bridge module for the mainlines to cross the canal, and figure out how to

get power across the canal using the inderside of a rail or road bridge.

I Wanted More!

- I wanted to see Passenger and Freight!
- I wanted to see wheels!
- I wanted it as a border to the City!

But first, I'm going to need some minifig rollerskates! And they were rare in 2017.

I found some in a used brick pile at Bricks by the Bay 2018, and found other parts to make my first "Auto Racks" (Car carriers).

- two minifig skates
- 1x8 white tile (since they are "Excess Height" rolling stock…)
- two 1x8 yellow plates (or dark red, or red, just a matching pair)
- four corrugated-wall 1x2 bricks.

Start with a plate.

On top of the plate, add the four corrugated bricks, facing the same direction.

Add the other plate on top of the corrugated bricks.

Top it off with the white tile, and add the skate wheels with the toe-stops facing away from the car.

I Wanted More!

- I wanted to see Passenger and Freight!
- I wanted to see wheels!
- I wanted it as a border to the City!
  - it wouldn't block the view of MOCs
  - could be a 2-Track main line
  - space for many cars on long trains

But first, I'm going to need some minifig rollerskates! And they were rare in 2017.

I found some in a used brick pile at Bricks by the Bay 2018, and found other parts to make my first "Auto Racks" (Car carriers).

- two minifig skates
- 1x8 white tile (since they are "Excess Height" rolling stock…)
- two 1x8 yellow plates (or dark red, or red, just a matching pair)
- four corrugated-wall 1x2 bricks.

Start with a plate.

On top of the plate, add the four corrugated bricks, facing the same direction.

Add the other plate on top of the corrugated bricks.

Top it off with the white tile, and add the skate wheels with the toe-stops facing away from the car.

I ordered 120 minifig skates (and a few other parts on my first Bricklink order!, and I started to experiment with Rolling Stock, both Passenger and Freight. And I was happy with the result! I tried making "track" from many colors of grill tiles. I finally settled on Dark Grey or Bley (I can mix them, but I do them in bunches, so it looks like "Welded Rail".

The 32x32 baseplate above let me look at variations on a model side-by-side..

- **Car height and length?**
- **Which way to face the corrugated bricks?**
- **Color combinations?**

Bricks Cascade 2020!

Nestled in one corner of a large 9-volt trains display, I spotted this beauty! It was separate from the Micropolis display (which was built on a 45-degree diagonal that year).

The street caught my eye first, then the main line tracks, then the YARD Tracks, and other rolling stock! Then I was sucked into the rail-served industries!

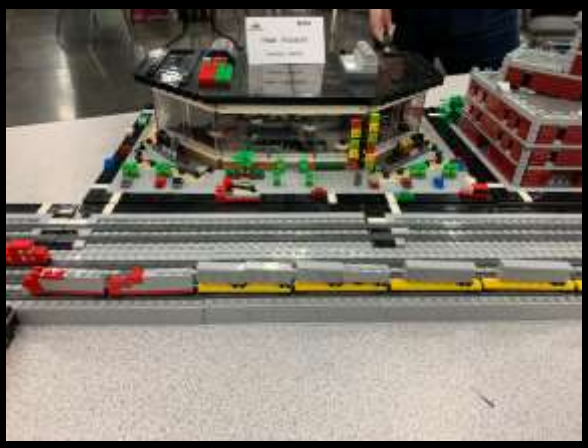
“Patrick” had made this. That was all I could find out from folks at the display. Nobody had seen him on Saturday. I really wanted to talk to him about this display!

Bricks Cascade 2020!

I got three good photos, that I could use to inspire my own designs and variations. It's what we've done for the 9-V trains since before there was a Worldwide Web! ☺

I loved the large grey road slopes used as a roof on the factory! I have a dozen of those parts at home!

Bricks Cascade 2020!



These Santa Fe SuperChief "War Bonnet" paint scheme F7 diesels were the inspiration for the units on my display today. I added a couple 1x1 blak plates to be the "port hole" windows on the side of the engine walls. I also added a couple 1x2 jumper plates in light grey below the red, as fuel tanks.

I left Bricks Cascade 2020 immediately after the closing ceremony and group photo, heading straight to the airport, and already thinking about what I wanted to display at Bricks by the Bay 2020! As we sat in the airport, the news was spreading about the first COVID deaths in a senior living facility in WA, not that far from the Portland Convention Center. In a week, we'd be in Lockdown in the SF Bay Area.

I would later get connected to Patrick on Facebook, and he'd introduce me to Brian Dag, who had inspired Patrick for a large microscale City Port with trains that was shown at Bricks Cascade 2019! They have been great folks to chat with about my train project!

I was INSPIRED!

I started a journal, just for Micro Trains! Before I could build it, I needed to imagine it. I'f I had an idea, I wrote it down, so that I'd remember it when I got back to my bricks! I'd DREAM about tiny trains, and I'd get up and write the idea down. If I didn't, I'd keep myself up thinking about the idea even longer!

I read back through my other LEGO journals, and found my first formal Micro Train ideas were written down in mid-2016, and my first model attempts in 2017. But now I was "full steam ahead!"

I started Five more Bricklink orders. Only two have arrived (the first; in 3 days, from Iowa. The second; in 3.5 weeks from Finland.),. I'm still waiting for packages from Singapore and Check republic (both seem to be stuck at USPS in New York…) and the last is from Germany, who will ship it as soon as the US agrees to accept packages from Germany again. ☹

I finally made one more large from a US vendor, and got it within a week, which allowed me to finish many more modules. I needed grill tiles, arch bricks, and more skate wheels!

I started a journal, just for Micro Trains! Before I could build it, I needed to imagine it. I'f I had an idea, I wrote it down, so that I'd remember it when I got back to my bricks! I'd DREAM about tiny trains, and I'd get up and write the idea down. If I didn't, I'd keep myself up thinking about the idea even longer!

I read back through my other LEGO journals, and found my first formal Micro Train ideas were written down in mid-2016, and my first model attempts in 2017. But now I was "full steam ahead!"

I started Five more Bricklink orders. Only two have arrived (the first; in 3 days, from Iowa. The second; in 3.5 weeks from Finland.),. I'm still waiting for packages from Singapore and Check republic (both seem to be stuck at USPS in New York…) and the last is from Germany, who will ship it as soon as the US agrees to accept packages from Germany again. ☹

I finally made one more large from a US vendor, and got it within a week, which allowed me to finish many more modules. I needed grill tiles, arch bricks, and more skate wheels!

I started a journal, just for Micro Trains! Before I could build it, I needed to imagine it. I'f I had an idea, I wrote it down, so that I'd remember it when I got back to my bricks! I'd DREAM about tiny trains, and I'd get up and write the idea down. If I didn't, I'd keep myself up thinking about the idea even longer!

I read back through my other LEGO journals, and found my first formal Micro Train ideas were written down in mid-2016, and my first model attempts in 2017. But now I was "full steam ahead!"

I started Five more Bricklink orders. Only two have arrived (the first; in 3 days, from Iowa. The second; in 3.5 weeks from Finland.),. I'm still waiting for packages from Singapore and Check republic (both seem to be stuck at USPS in New York…) and the last is from Germany, who will ship it as soon as the US agrees to accept packages from Germany again. ☹

I finally made one more large from a US vendor, and got it within a week, which allowed me to finish many more modules. I needed grill tiles, arch bricks, and more skate wheels!

I was INSPIRED!

- Just 4 months until Bricks by the Bay!
- One week later, we were in Lockdown!
- A month after that, our venue was turned into a county field hospital.

I started a journal, just for Micro Trains! Before I could build it, I needed to imagine it. I'f I had an idea, I wrote it down, so that I'd remember it when I got back to my bricks! I'd DREAM about tiny trains, and I'd get up and write the idea down. If I didn't, I'd keep myself up thinking about the idea even longer!

I read back through my other LEGO journals, and found my first formal Micro Train ideas were written down in mid-2016, and my first model attempts in 2017. But now I was "full steam ahead!"

I started Five more Bricklink orders. Only two have arrived (the first; in 3 days, from Iowa. The second; in 3.5 weeks from Finland.),. I'm still waiting for packages from Singapore and Check republic (both seem to be stuck at USPS in New York…) and the last is from Germany, who will ship it as soon as the US agrees to accept packages from Germany again. ☹

I finally made one more large from a US vendor, and got it within a week, which allowed me to finish many more modules. I needed grill tiles, arch bricks, and more skate wheels!

I was STILL Inspired!

- Just 4 months until Bricks by the Bay!
- One week later, we were in Lockdown!
- A month after that, our venue was turned into a county field hospital.

But I held on to hope for a display…

I started a journal, just for Micro Trains! Before I could build it, I needed to imagine it. I'f I had an idea, I wrote it down, so that I'd remember it when I got back to my bricks! I'd DREAM about tiny trains, and I'd get up and write the idea down. If I didn't, I'd keep myself up thinking about the idea even longer!

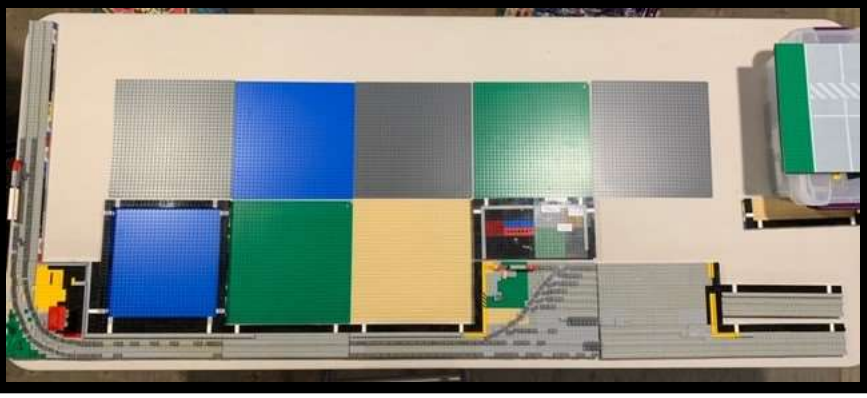
I read back through my other LEGO journals, and found my first formal Micro Train ideas were written down in mid-2016, and my first model attempts in 2017. But now I was "full steam ahead!"

I started Five more Bricklink orders. Only two have arrived (the first; in 3 days, from Iowa. The second; in 3.5 weeks from Finland.),. I'm still waiting for packages from Singapore and Check republic (both seem to be stuck at USPS in New York…) and the last is from Germany, who will ship it as soon as the US agrees to accept packages from Germany again. ☹

I finally made one more large from a US vendor, and got it within a week, which allowed me to finish many more modules. I needed grill tiles, arch bricks, and more skate wheels!

Where are my trains?

- Mainline track and corner modules
- Modular yards (singe- or double-ended)



I was going to unveil this at Bricks by the Bay 2020, wrapped around the Micropolis city that would doubtless rise there. But, we're virtual this year, and I'm giving a presentation so I can show it to you.

I like trains. I'm trained to work on train crews. I go sit near a local train yard to watch switching operations, and to look at all the rolling stock that comes through town as Interstate commerce happens.

Trains rarely appear in "downtown", unless it's a commuter train line. Freight is usually pushed out to the Industrial section of town, or "around the edge" of the city.

At BayLUG, a few folks had started making "Edge Trim" parts (to hide the details of the module bases). I thought "Why not put a train line along the edges?"

It started with a corner

While I waited for my first Bricklink order, I worked on the corner module.

It would need to fit in a storage bin, so it needed to have two parts, joined by Technic pegs.

I was building it while watching Flynn and Richard video chat with other LEGO Masters. I felt like we were building together, even though we were in lockdown.

The curve would be rebuilt 4 times in 4 months, as more modules came together.

As an Essential Worker, I was in a Data Center about 80% of the days, and at home for 20%, leaving little time for hobbies.

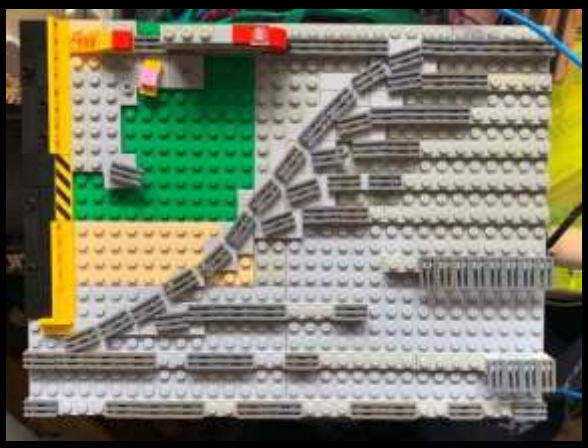
Then I added some main line

My first attempt at the Mainline Modules. Fast and dirty. 2x2 Technic Peg Bricks for the anchors, and "boat buttons (2x2 curved-bottom tiles?)instead of flat tiles. I was intending to just plug into the other City modules. I added a 2x4 brick in the middle to help join 6x16 plates.

But, over time, the "track"(1x2 grill tiles) and "ballast" (1xN plates)were starting to cause the modules to "bow" along their length! The needed to be rebuilt, with beams along the long sides! May as well make them Micropolis2 compliant!

As the corner came together, I added a road edge to it, and realized that some of the main line modules should also have a road edge… from 6-wide to 8-wide, they'd need to be rebuild as well. I'd add a 1x4x1 fence part, which also added a sidewalk to that extra road. This looked great!

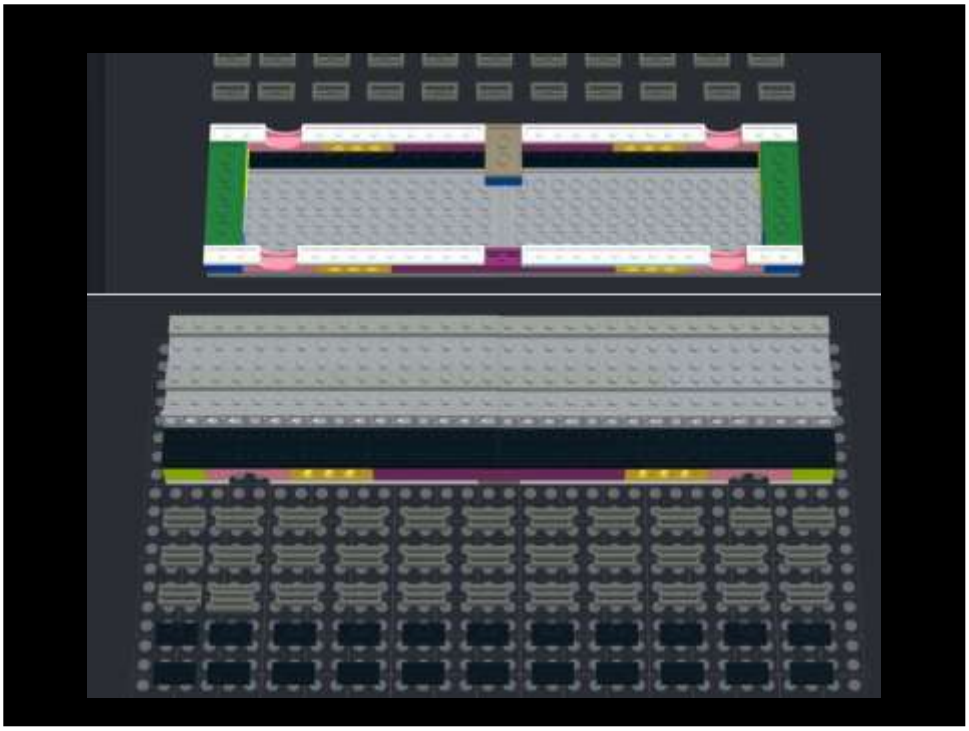
Then I added a Yard module



At the top of the image, you see a lead to service the yard locomotive, with an end-of-track buffer so it doesn leave the yard to cross the road. That engine lead connects to the run-around track (you don't park cars there).There are five yard leads.

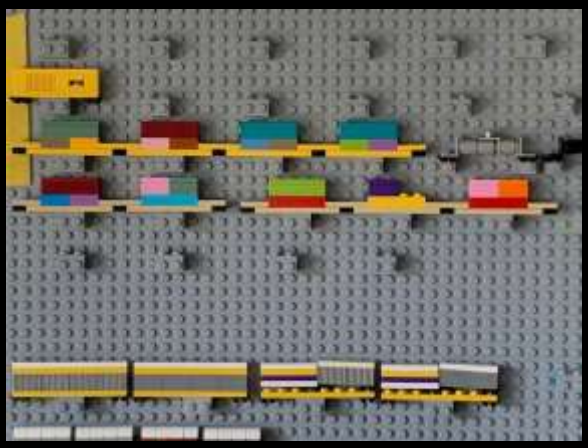
Because the road that parallels the main line goes AROUND the yard, those extra 2-studs are used for a Passing Siding (if it's a double-ended yard, or as a "set out track" for a single-ended yard.

I'd build the "Left Yard" first, to see how it turned out. When I made the second yard base, I just dressed it as a single-ended yard, and the idea looked as good as I'd hoped! I finished the Right Yard, and got ready for a photo shoot!



I started to learn Studio2, and make some instructions for my builds. I've documented the yard module, this is a Mainline Module. I've also done many of the cars. Now I need to find a place to put the files!

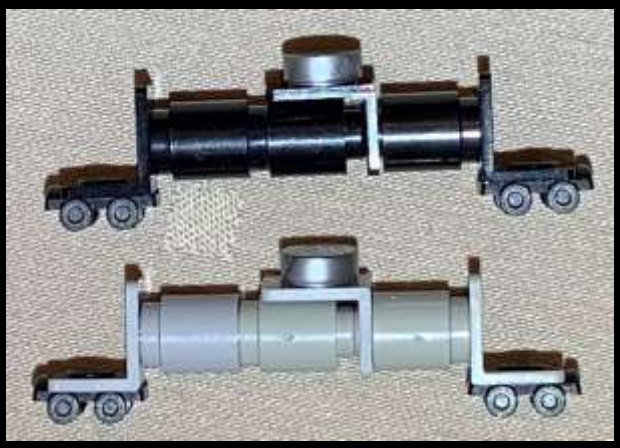
Then I made Rolling Stock



After the second Bricklink order came in, I started back to making rolling stock! I now had many mainline modules, and I was going to need MANY auto racks. And I wanted to make some Intermodal Freight!

I wanted the containers to be very colorful, because it's LEGO! I'd have 20', 40' and 48' containers. I would use a 64x64 stud large baseplate for these larger cars! And, it turns out that you cannot use the minifig rollerskates (unless you modify them…. Maybe, someday…) so I use a 1x1 black plate instead.

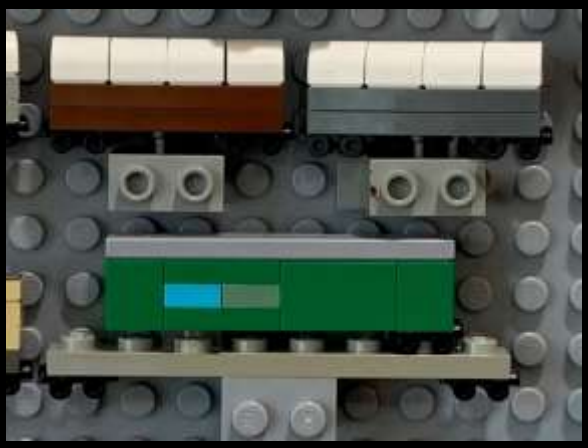
Then I made Rolling Stock



After the second Bricklink order came in, I started back to making rolling stock! I now had many mainline modules, and I was going to need MANY auto racks. And I wanted to make some Intermodal Freight!

I wanted the containers to be very colorful, because it's LEGO! I'd have 20', 40' and 48' containers. I would use a 64x64 stud large baseplate for these larger cars! And, it turns out that you cannot use the minifig rollerskates (unless you modify them…. Maybe, someday…) so I use a 1x1 black plate instead.

Then I made Rolling Stock



After the second Bricklink order came in, I started back to making rolling stock! I now had many mainline modules, and I was going to need MANY auto racks. And I wanted to make some Intermodal Freight!

I wanted the containers to be very colorful, because it's LEGO! I'd have 20', 40' and 48' containers. I would use a 64x64 stud large baseplate for these larger cars! And, it turns out that you cannot use the minifig rollerskates (unless you modify them…. Maybe, someday…) so I use a 1x1 black plate instead.

And I filled the yard!

I filled the main lines with as many cars as I could. The Unit Trains fill the straighaway side, and some boxcars and shorter rolling stock are on the curve. The Intermodal design does NOT flex well enough to meet the radius of that turn. (But it's a good scale version of the 9-volt LEGO Train curved track. ;-)

The yard was where much of the "other" rolling stock went. This is only the "Left" and the "Right" yard modules together.

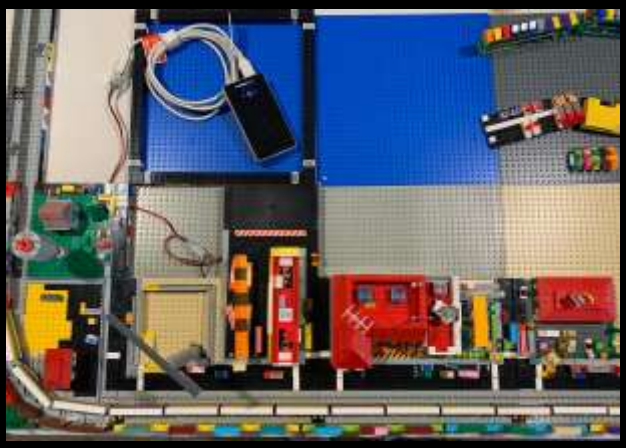
For a second video shoot, I added a "mid-yard" modules (simply straight tracks, all the way through, and re-filled the yard.

And the Main Lines!

The display table is 6’ long, and 3’ wide. There are two freight trains, each with an A-B-A F7 power lash-up in front, and a red caboose at the rear.

Eastbound is 18 autoracks, with some mixed freight at the rear. Westbound is an Intermodal “Unit Train” with some boxcars at the rear. There is Southern Pacific passenger train (in the grey and red “LARK” livery) holding the siding, ready to fall in behind the auto racks.

And I added MOCs…



Some have power and are lit. Others are static buildings. They are in place to show off the road section of the mainline modules.

The little park near the Corner Module is a good space filler, and it gets the road grid back in order.

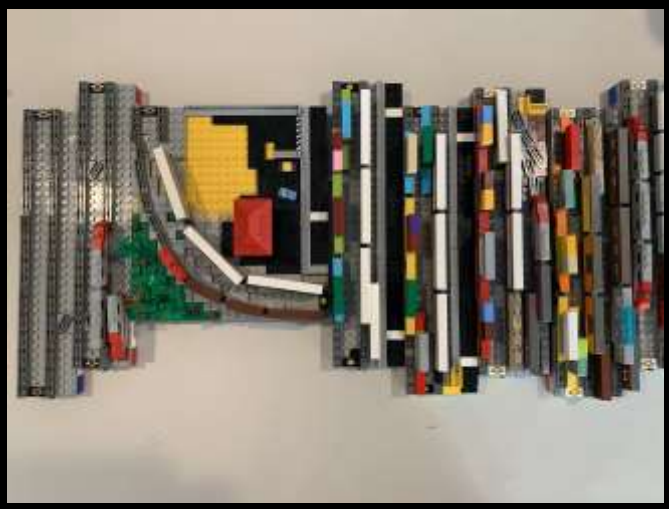
And I expanded the yard!

By removing one Main Line module, I could expand the yard, and the passing siding. (The trains that used to be on that siding simply shifted one module to the right, since the total length of the main lines was still 6'.

This is a video pass, 35 seconds long, starting at the Right Yard entrance, and flying to the curve and te departure tracks.

You can see the 3-section yard, the dual main lines, the MOCs along the way, and the corner module with it's Control Tower.

And it packs into 3 tubs!



What questions do you have?

Micropolis, Micropolis2, Trains, …

See you at BbtB 2021!

Santa Clara Convention Center
June 17-20, 2021
Our 2021 Theme will be: **Looking Back**
(You can display the Vision 2020 MOCs that you could not display this year!)

Bring YOUR Micropolis2 MOCs!

I hope you've enjoyed this session. Fingers crossed that by Summer of 2021;

- **We'll have some Herd Immunity**
- **We'll be able to meet in person, and hug people again!**
- **I hope we'll have a vaccine to try!**

I look forward to Club Meetings, digging through used brick, pawing parts on the Pick-a-Brick wall, and going to vacations again. I want to travel to a few other conventions (even if I have to take a train or drive there).

Until then, Wash Your Hands, Wear Your Mask, and Don't Touch Your Face! ☺

Up next:

I'll be in Room 3, for Micropolis Panel!

Coming up in Room 1: Flynn & Richard!

Flynn & Richard have been streaming their LEGO building sessions for a few months!

They were on the first season of LEGO Masters in the USA! And they often have some of their fellow LEGO Masters drop-in on the streams, and I hear that another team from that first season will be moving to the Bay Area soon!

(I hope it's going to be recorded, since I'll be moving to Room 3, to join Bill Ward, Naomi (Brickanista), and Davin White (and hopefully Christian Benito) to field questions about Micropolis, and we hope to continue the inspiration.)