

VANGUARDFX

Vanguard Crowd

People who walk, stop, sit, cross at the lights and run from danger, with their own traffic. For 3ds Max 2024 - 2027.

USER GUIDE · VERSION 1.0.21

1 Getting started

What you need

- Windows 10 or 11, 64-bit, and 3ds Max **2024, 2025, 2026 or 2027**.
- **Any graphics card.** Crowd simulates on the CPU, on all cores. No NVIDIA card is needed.
- Optional: **VanguardCity** 2.1.29 or later for pavements, zebra crossings, traffic lights and lanes; **Vanguard Tornado** for real wind; **Vanguard Fire** for people caught by flames.

Install

1. Close every running 3ds Max. A running Max keeps the plugin file locked.
2. Run `VanguardCrowd_Setup_1.0.21.exe` as administrator and tick the Max versions you use.
3. Start Max. The object is in **Create › Geometry › VanguardFX › VanguardCrowd**; the **Crowd** macro is in the VanguardFX category of Customize User Interface.

The gizmo

Every Crowd shows the VanguardFX mark with *VANGUARD CROWD* at its position, like a helper. It is drawn in the viewport only, never in a render.

Activate your licence

1. Select a Crowd, open the Modify panel and expand **Licence** at the bottom.
2. Copy the **Hardware ID** shown there and give it with your order on vanguardfx.pro.
3. Sign in, open **My licences** and press **Download licence file**.
4. Press **Load file…** in the Licence rollout (or paste the file's text) and install it. No restart is needed.

> **The key is not the file.** If you paste the short licence key, Crowd tells you so. It needs the licence file issued for this computer's Hardware ID.

Without a licence every crowd holds **10 people and 10 cars**, with every feature on, so you can try it all before you buy. A licence includes a year of updates; builds from that year keep working after it.



One Crowd object: people walking, standing in groups and on the phone over a picked floor.

2 Your first crowd in 5 steps

1 **A floor**

Open your scene, or draw a Plane. Real-world size matters: Crowd works in metres whatever your units are.

2 **Create the crowd**

Create › VanguardFX › VanguardCrowd and click in the viewport. With nothing picked, people already mill about in a 12 m square round the icon.

3 **Tell them where to walk**

Select your floor; in **Crowd - Where › Walk on** press **Add**. Floors, stairs, ramps and roofs all work. For a whole city, pick a VanguardCity in **City** instead.

4 **Pick a preset**

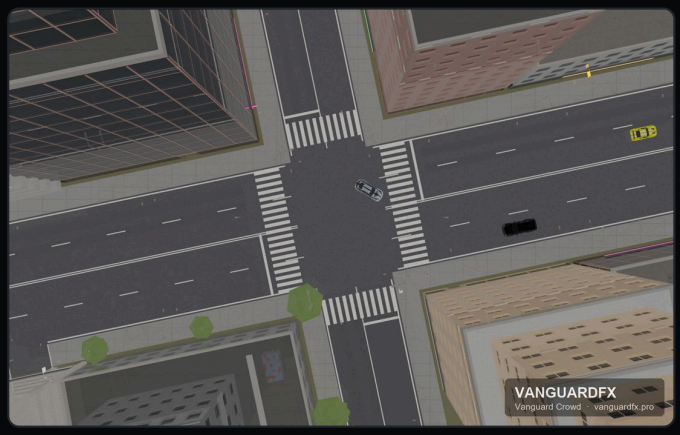
In **Tools**, choose the kind of place: Plaza, Station, Stadium, Hospital, City street... It sets how many people, how they move and what they wear. It never touches what you picked.

5 **Simulate, assign, render**

Press **Simulate** and play: 1,000 people for 300 frames take about two seconds. Press **Assign material** and render with any renderer.



Step 4: presets mix outfits for the place: business, doctors, police, fans, tourists.



Pick a VanguardCity and add the car pack preset: people and traffic together.

3 Every control, rollout by rollout

The Modify panel, top to bottom. Distances are metres and speeds m/s whatever your scene units. **Tools** (top): Add selection, the preset list, **Simulate**, **Assign material**, **Bake point cache**, **Bake to keyframes**. **Licence** (bottom): see Getting started.

Crowd - Where

Everything people may use: what they walk on and along, what they avoid, where they head, where you place them by hand. Lists take **Add** (the selection) and **Remove**.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
WALK		
Walk along (splines)	list	Splines people walk along, both ways, in lanes. Use for a pavement, corridor or path you drew yourself.
Walkway width (m)	3 0.5 - 100	How wide the walkway along each spline is. Match the real pavement.
WANDER		
Wander inside (closed splines)	list	Closed splines people wander inside. Draw one over a sloped surface in Walk on and they follow the slope.
AVOID		
Walk around (objects)	list	Objects people walk around: columns, planters, kiosks.
SURFACES		
Walk on (floors, stairs, ramps, roofs)	list	Floors, stairs, ramps, roofs. Anything up to 60 degrees is walkable; people slow down on slopes and stairs.
ESCALATORS		
Escalators (splines, drawn bottom to top)	list	Splines drawn from the bottom to the top. Some passers-by step on and ride.
Escalator speed (m/s)	0.5 0.1 - 3	How fast the escalator carries people.
VEHICLES		
Keep clear of (moving objects)	list	Animated objects people keep clear of: a car you animated, a forklift, a cart.
VANGUARDCITY		
City	pick	A VanguardCity. People use its pavements, park paths and zebra crossings and obey its lights.
People on the roofs too	off	Also put people on the City roofs (see the Roofs share below).
People in the parks	on	Let people into the City parks.
ESCALATORS		
Passers-by who take it	0.3 0 - 1	The share of passers-by who take the escalator.
SURFACES		
Highest step (m)	0.45 0.05 - 1.5	People never step off an edge higher than this. Raise it for big steps, lower it to keep people off kerbs.
CITY: HOW MANY WHERE		
Pavements	1 0 - 10	How many people on City pavements, relative to the others. 0 keeps people off entirely.
Park paths	0.5 0 - 10	Share on park paths.
Lawns and grass	0 0 - 10	Share on lawns and grass (0 = keep off the grass).

Beach (by the water)	0.5 0 - 10	Share on the beach by the water.
Roofs (needs the box above)	0.01 0 - 10	Share on roofs. Needs People on the roofs too.
SURFACES		
Keep back from roof edges (m)	1 0 - 5	Distance kept back from an unguarded roof or terrace edge.
VANGUARDCITY		
Walk around trees, poles, sign legs	on	Walk around the City trees, lamp posts, sign legs, bridge piers and rooftop plant.
Wait for City edits to settle (s)	1.5 0 - 30	While you edit the City, the crowd keeps its people and rebuilds once the City has been still this long.
GOALS		
Head for (any objects)	list	Any objects: a share of the walkers find their own way there over the surfaces and wait near it (a stage, a door, a bus stop).
Walkers who head there	0.5 0 - 1	The share of walkers who head for the goals.
PLACE BY HAND		
Place in (closed splines, objects)	list	Closed splines or objects to fill by hand with standing people: a queue area, an audience.
People per 100 m2 (crowd=N on an object)	20 0 - 1000	People per 100 m2 in each zone. 20 is a busy square, 100 a packed audience.
Stand along (painted strokes)	list	Painted strokes (splines) people stand along: a queue, a line watching a parade.
Spacing along a stroke (m)	0.8 0.3 - 20	The gap between people along a stroke.
They face	Left of the stroke	Which way the people on a stroke look. *Options: Left of the stroke, Right of the stroke, The target.*
Target	pick	The object they look at when They face = The target.
START AT THE ICON		
Also start people round the icon	off	Also start people in a square round the Crowd icon. With nothing picked this is what you get.
Square round the icon (m)	12 1 - 1000	The size of that square.
People start	Over everything picked	Where people start: over everything picked, round the icon, or at a world point. *Options: Over everything picked, Round the icon (local), At a world point.*
World X (m)	0 -100000 - 100000	World point X.
World Y (m)	0 -100000 - 100000	World point Y.
World Z (m)	0 -100000 - 100000	World point Z.

People

Who is in the crowd and how they walk.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
CROWD		
People	100 0 - 100000	How many people. Without a licence a crowd holds 10.
Seed	1 0 - 999999	A different arrangement with the same settings.
WALKING		

Walking speed (m/s)	1.3 0.2 - 3	Average walking speed. 1.3 m/s is a normal city pace; 1.0 strolling; 1.5 hurrying.
Speed random	0.15 0 - 0.6	How much speed differs from person to person.
SIZE		
Height (m)	1.72 1.3 - 2.1	Average height.
Height random (m)	0.06 0 - 0.2	Height spread.
GROUPS		
Walk in pairs	0.25 0 - 1	The share of people who walk in pairs and small groups.
Standing (talk, idle, phone)	0.1 0 - 1	The share who stand: talking in groups, idle, on the phone.
LOOK		
Clothes seed (0 = crowd seed)	0 0 - 999999	Re-dresses everyone without moving anyone. 0 follows the crowd seed.
Women	0.5 0 - 1	The share of women.
JOBS BY PLACE		
Near a hospital, police... dressed for it	0.6 0 - 1	With a City: near a hospital more doctors and nurses, near civic buildings and police cars more police.
Maintenance workers on the roofs	on	Maintenance workers in high-vis on the City roofs.
SIZE		
People size (x, all together)	1 0.05 - 100	Scales everyone. Use only if your scene is not built in real-world units.

Seats

Benches and chairs.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
SEATS		
Sit on (benches, chairs)	list	Benches and chairs. People sit, get up, and passers-by sit down.
Seats taken at the start	0.6 0 - 1	The share of seats taken at frame 0.
Passers-by who sit down	0.15 0 - 1	The share of passers-by who sit down when they pass a free seat.
Sit at least (s)	20 1 - 3600	Shortest time seated.
Sit at most (s)	90 1 - 3600	Longest time seated.
SEAT SHAPE		
Seat height (m)	0.45 0.2 - 1.2	Seat height of your benches.
Seat spacing (m)	0.6 0.3 - 3	Room per person along a bench.
People face	Automatic (open side)	Which way people face on a seat. Automatic picks the open side. *Options: Object front (-Y), Object back (+Y), Both sides, Automatic (open side).*

Behaviour

Stops, spacing, turning, danger and fire.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT

STOPS		
Stops per minute	0.6 0 - 20	How often a walker stops (to look, to check a phone). A museum is 2-3, a station 0.2.
Stop at least (s)	2 0.1 - 600	Shortest stop.
Stop at most (s)	7 0.1 - 600	Longest stop.
On the phone	0.3 0 - 1	The share of stops spent on the phone.
WALKWAY ENDS		
Turn back at an open end	0.3 0 - 1	At an open end of a walkway, the share who turn back rather than walk off.
SPACING		
Personal space (m)	0.25 0 - 2	Extra room each person keeps. 0.1 for a packed concourse, 0.4 for an office.
DANGER (FLEE FROM)		
Flee from (tornado, fire, any object)	list	Anything people run from: a fire, an explosion, a Vanguard Tornado. Animate it and they react as it moves.
Danger radius (m)	25 0 - 10000	Everyone inside this distance runs straight away from the danger.
Running speed (m/s)	3.5 0.5 - 8	How fast they run. 3.5 m/s is a jog, 6 a sprint.
ROOFS		
Stop at a parapet and look over	0.3 0 - 1	At a parapet, the share who stop and look over.
DANGER (FLEE FROM)		
Ragdolls at most (0 = none)	200 0 - 5000	With a Vanguard Tornado: up to this many people are lifted as real ragdolls and fall where they land.
Ragdolls only inside (empty = anywhere)	list	Ragdolls only inside these objects; everyone else runs.
TURNING		
Turn smoothness (people and cars)	0.5 0 - 1	How gently people and cars turn. Lower is snappier.
Aggression (shoving, fights)	0 0 - 1	Shoving and the odd fight in a dense crowd. Keep 0 for normal scenes.
ON FIRE		
Vanguard Fire domains	list	Vanguard Fire domains: people caught by the flames run burning, then fall.
Seconds running on fire before falling (s)	4 0.5 - 30	Seconds a burning person runs before falling.

Simulation

The frames that are simulated. Crowd simulates as far as you play; Simulate does the whole range at once.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
RANGE		
Use the scene range	on	Simulate the scene range. Untick to set the range yourself.
Start frame	0 -100000 - 100000	First simulated frame.
End frame	300 -100000 - 100000	Last simulated frame.

Viewport & Render

Keep the viewport fluid and the render right.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
VIEWPORT		
Show	Smart: detail by view (fast)	How people are drawn in the viewport. Smart gives full detail near the view, less far away, and skips people out of view. *Options: People (light), People (full detail), Markers only, Smart: detail by view (fast).*
Show % of people	100 0 - 100	Draw only this share of the people in the viewport. The render always has everyone.
RENDER		
Detail	Smart: by size in the camera	Render detail by size in the camera, always full, or always light. *Options: Smart: by size in the camera, Always full, Always light.*
Full detail within (m)	30 0 - 10000	Full detail within this distance.
Light beyond (m)	80 0 - 10000	Light detail beyond this distance.
SMART DETAIL		
Judge size from	The active viewport	Judge size from the active viewport, or from a camera. For final frames pick the render camera. *Options: The active viewport, A camera.*
Camera	pick	The camera Smart detail measures from.
Viewport triangle budget	600000 10000 - 5e+07	Triangle budget for Smart in the viewport. Lower it if playback stutters.
Skip people out of view (viewport)	on	Skip people outside the view in the viewport.

Your Own Characters

Bring your own animated people, animals or robots into the crowd.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
WALK CYCLE		
Walking	pick	Any animated mesh walking: a person, a dog, a robot.
Cycle start frame	0 -100000 - 100000	First frame of its walk cycle.
Cycle end frame	30 -100000 - 100000	Last frame of its walk cycle.
Distance per cycle (m)	1.4 0.1 - 10	Distance covered per cycle, so the feet do not slide.
STANDING		
Standing	pick	A standing loop.
Loop start frame	0 -100000 - 100000	Loop start.
Loop end frame	60 -100000 - 100000	Loop end.
SITTING		
Sitting (pose at its first frame)	pick	A sitting pose (its first frame is used).
MIX		
Share of the crowd	0 0 - 1	The share of the crowd that uses your character.
Keep its own size (animals, children)	off	Keep its own size instead of the crowd heights: animals, children.

Its walking speed (m/s, 0 = crowd)	0 0 - 20	Its own walking speed (0 = the crowd speed).
Its body radius (m, 0 = person)	0 0 - 5	Its body radius (0 = a person).
WALK CYCLE		
More walkers (same cycle frames)	list	More walkers that use the same cycle frames, for variety.
RUNNING		
Running	pick	A running cycle, used when people flee.
Cycle start frame	0 -100000 - 100000	Run cycle start.
Cycle end frame	20 -100000 - 100000	Run cycle end.
Distance per cycle (m, 0 = measured)	2.6 0.1 - 20	Distance per run cycle (0 = measured).
WALK CYCLE		
Measure the stride from the animation	on	Measure the stride from the animation itself.

Outfits (who is in the crowd)

Each outfit slider is the share of the crowd in that outfit, 0 to 1; casual clothes take whatever is left. A preset sets a mix for its place.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
WORK		
Business	0 0 - 1	
Construction worker	0 0 - 1	
Site engineer	0 0 - 1	
Doctor	0 0 - 1	
Nurse	0 0 - 1	
Police	0 0 - 1	
Chef	0 0 - 1	
Security	0 0 - 1	
Courier	0 0 - 1	
Waiter	0 0 - 1	
LEISURE		
Student (backpack)	0 0 - 1	
Tourist	0 0 - 1	
Sports fan	0 0 - 1	
Fan teams (colours)	2 1 - 2	One or two team colours for the sports fans.

Traffic (VanguardCity)

Cars, trucks and buses that drive the City lanes or your own roads, keep their distance, stop at red lights and zebras, give way at crossings and move over for oncoming cars.

CONTROL	DEFAULT / RANGE	WHAT IT DOES, WHEN TO CHANGE IT
CARS		
Cars (0 = none)	0 0 - 20000	How many cars. With a City they drive its lanes; otherwise they need Roads.
Speed (m/s, 13.9 = 50 km/h)	13.9 1 - 40	Cruising speed. 13.9 m/s = 50 km/h; 8.3 = 30 km/h; 22 = 80 km/h.
Trucks	0.1 0 - 1	The share of trucks.
Stop for people in the road	on	Cars stop for people in the road and at zebras.
Turn the City's own cars off	on	Hide the City's own cars, so only the Crowd cars drive.
DESTINATIONS		
Drive to (any objects)	list	Objects cars drive to and park at: a car park, a stadium entrance.
Cars that drive there and park	0.5 0 - 1	The share of cars that drive to the goals.
CARS		
Roads (splines, drawn the way cars go)	list	Without a City: splines drawn the way the cars drive. Leave empty with a City.
Buses	0.05 0 - 1	The share of buses.
Gap to the car in front (m)	2 0.5 - 20	The distance a car keeps to the one in front when it stops.
YOUR CARS		
Car models (wheels: children named wheel/tire/rim)	list	Your own car models. Children named wheel, tire or rim turn as wheels. Empty = built-in cars.
Share of the cars	1 0 - 1	The share of cars that use your models.
Model scale	1 0.01 - 100	Scale for your models if they are not in real-world size.
Models face the other way	off	Tick if your models drive backwards (their front points the other way).
CARS		
Cars in the viewport	The models	How cars are drawn in the viewport. The render always has the models. *Options: The models, Simple boxes (fast), Arrows (fastest).*
Drivers look ahead (m)	30 5 - 200	How far ahead drivers watch every lane. They follow, give way at crossings and move over for oncoming cars.

4 Presets and recipes

The Tools rollout holds 16 presets: *Plaza, Shopping mall, Stadium / arena concourse, Train station / airport, Office lobby, Hospital, Construction site, Restaurant / food court, Park, City street, University campus, Rooftop terrace / bar, Museum / gallery, Event security, Flood: everyone on the City roofs, City traffic: Vanguard car pack*. A preset resets the people and behaviour settings it owns, then sets its own; the car pack preset only adds cars and leaves your people as they are. Five ready setups:

A busy city street

Pick a VanguardCity, apply **City street**, then **City traffic: Vanguard car pack**.

People	500
Walking speed	1.35 m/s
Walk in pairs	0.22
On the phone	0.4
Business	0.25
Cars	120, car pack models
Drivers look ahead	30 m
Cars in the viewport	Simple boxes (fast)

A train station concourse

Floors and stairs in Walk on, escalators drawn bottom to top.

People	800
Walking speed	1.45, random 0.20
Stops per minute	0.2
Personal space	0.35 m
Passers-by who take it	0.6
Business / Tourist	0.30 / 0.20

A stadium on match day

Seats picked; Head for = the gates.

People	1500
Walking speed	1.05 m/s
Standing	0.30
Personal space	0.10 m
Seats taken at the start	1.0
Sports fan	0.80, 2 teams

A quiet museum

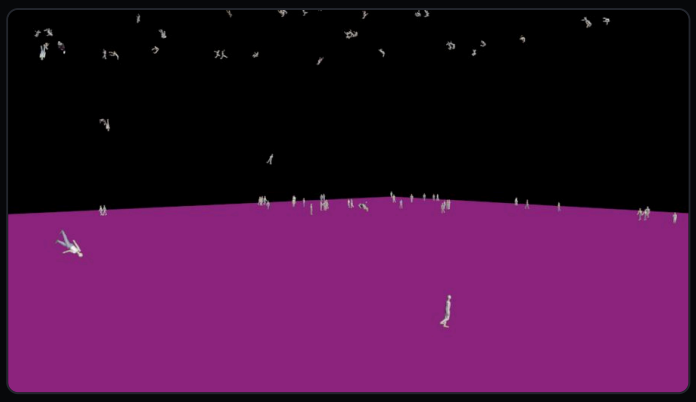
Head for = the exhibits; people stop often and keep their distance.

People	120
Walking speed	0.90 m/s
Stops per minute	2.5
Stop at least / most	5 / 20 s
Personal space	0.45 m
Tourist	0.30

A tornado through a city

A Vanguard Tornado in Flee from; press Simulate once more after adding it.

Danger radius	60 m
Running speed	5 m/s
Ragdolls at most	200
Cars	80
Stop for people in the road	on
Render detail	Smart, judged from the camera



Up to 200 ragdolls tumble in a Vanguard Tornado and sprawl where they land; everyone else runs.

5 Rendering and export

Renderers

The crowd is an ordinary mesh, so **Corona, V-Ray, Arnold, Scanline** and any other renderer render it, with motion blur. Nothing has to be ticked.

Materials

Press **Assign material** (Tools): one Multi/Sub-Object with every skin, hair, clothing, car and tyre colour, each named (34 sub-materials). Replace any sub-material with your own Corona or V-Ray material and keep its ID. Your own characters keep their material IDs from 100 up; the car pack keeps its own materials.

Detail in the render

Viewport › Show	Smart: detail by view
Render › Detail	Smart: by size in the camera
Judge size from	A camera = your render camera
Full detail within / light beyond	30 m / 80 m
Cars in the viewport	Boxes or arrows (render keeps models)

Measured on 1,500 people: a near camera renders 1.04 M faces, a far one 0.66 M, *Always full* 2.43 M. Smart is just as sharp where it matters and far lighter.

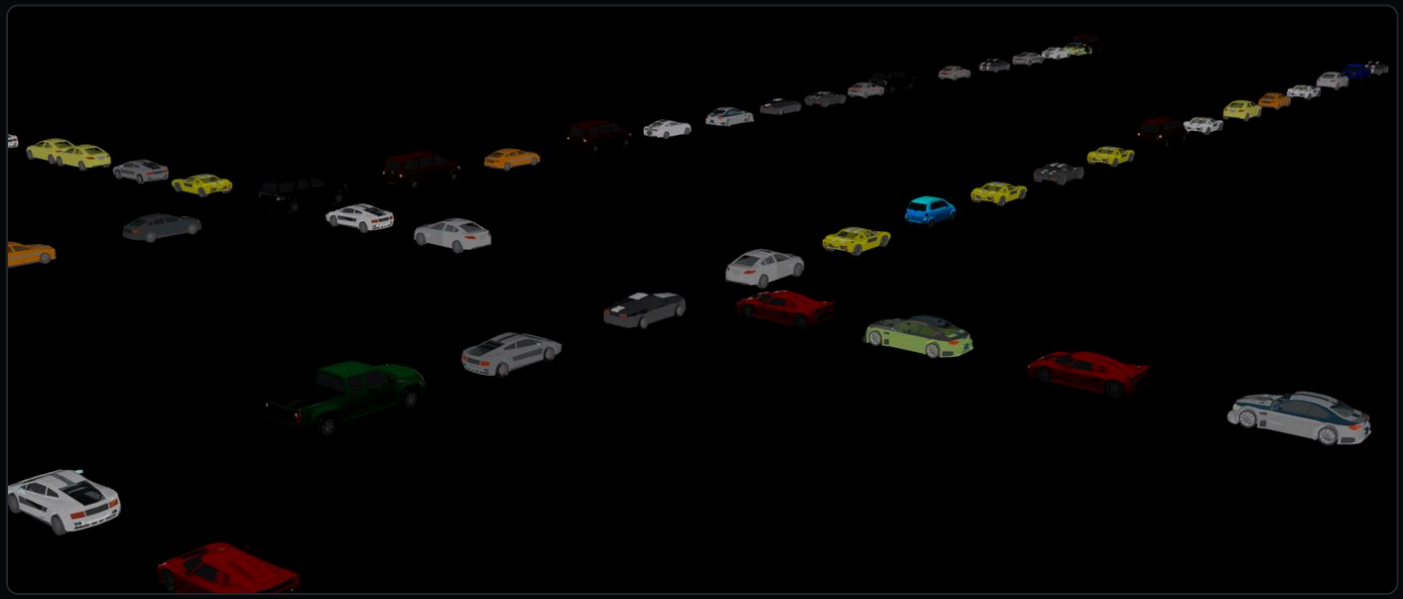
Typical settings

Motion blur	Camera shutter 180° (0.5 frame)
Frame rate	25 or 30 fps; Crowd follows the scene
Before a network render	Simulate, or bake a point cache
Corona / V-Ray	Default GI; no special settings

Baking

Bake point cache	A .pc2 per crowd: fast playback, render farms, other software
Bake to keyframes	One animated object per person, to hand-edit a few

> For a render farm, bake a point cache: the farm nodes then need no simulation. The simulation is deterministic: the same settings give the same crowd on any machine.



The Vanguard car pack: 28 models with turning wheels, driving the City lanes.

6 Troubleshooting and FAQ

"UNLICENSED: 10 of N people"	Open Licence and load the licence **file** (not the key) issued for this computer's Hardware ID.
People walk where they should not	Check Walk on and the shares in *City: how many where*. A share of 0 keeps people off that ground.
Nobody crosses at the zebras, or no cars on the City	VanguardCity 2.1.29 or later is needed, and Cars above 0. Open the City once so it exports its crossings and lanes.
Turning cars on removed my people	Fixed in 1.0.20: the car pack preset only adds cars. In older builds apply your people preset again afterwards.
Cars look as if they drive backwards	The pack cars drive nose first; two cars meeting in one lane looked like that. 1.0.20 separates the lanes, and drivers look 30 m ahead and move over. For your own model, tick *Models face the other way*.
Smart detail ignores my camera in the viewport	Set Show = Smart and Judge size from = A camera. Since 1.0.20 moving or zooming that camera updates the detail.
The tornado does not lift anyone	Press Simulate after adding the tornado to Flee from: that is when Crowd asks it for its wind.
The viewport is slow	Show = Smart, lower the triangle budget or Show % of people, and set Cars in the viewport to boxes or arrows.
The crowd stops updating while I edit the City	On purpose: it rebuilds once the City has been still for *Wait for City edits to settle* seconds, so editing stays fast.
The installer cannot replace the plugin	Close every 3ds Max first. Max 2025 - 2027 need the installer run as administrator.

7 Requirements and licence

3ds Max	2024, 2025, 2026, 2027
System	Windows 10 / 11, 64-bit
Graphics	Any; no NVIDIA GPU needed
Renderers	Any (Corona, V-Ray, Arnold, Scanline)
Works with	VanguardCity 2.1.29+, Vanguard Tornado, Vanguard Fire

One licence, one computer. A licence is issued for the Hardware ID of one machine and includes a year of updates. Builds released in that year keep working for good.

Help, updates and support:
support@vanguardfx.pro
vanguardfx.pro