Recent upgrade for Ethereum:

1)Pectra upgrade:

Activated on 7 May 2025.

It went live on 7 May 2025.

Combined Prague and Electra updates to optimize both the execution and consensus layers.

Key changes include:

Raising the maximum validator stake from 32 ETH up to 2,048 ETH per validator.

Introduction of “smart accounts” / account abstraction (so wallets/users get more flexibility; e.g., pay gas in different tokens, batch transactions) via EIPs like EIP-7702.

Some scaling / data-availability improvements, especially in support of Layer-2 rollups.
Layer-2s, Arbitrum, Optimism, Base, zkSync, are blockchains built on top of Ethereum.
They process transactions off-chain (faster and cheaper) but still use Ethereum (Layer-1) for:
Security (Ethereum finalizes them)
Data availability (DA) — posting compressed data or proofs back to Ethereum.So, L2s depend heavily on Ethereum’s capacity to store data efficiently and cheaply.

This upgrade aimed more at :

Usability and Staking in order to make the network more efficient.

2)The next upcoming upgrade is: Fusaka upgrade (scheduled for December 2025).

Pectra brought smart accounts, increased staking limits, improved Layer 2 data processing, dynamic blob scaling, and more…for laying the groundwork for Fusaka’s further technical advances.
Key feature:

PeerDAS (Peer Data Availability Sampling) — this allows validators/nodes to verify only parts of the data (“blobs”) instead of entire blocks, reducing bandwidth & resource load, which helps L2s scale.

It also increases “blob capacity” (the data units used to service L2 rollups) and is focused heavily on scalability and cost for L2s.

So the roadmap is:
Usability & Staking improvements (Pectra) → Deeper Scaling/Data improvements (Fusaka)

Implications:
The Pectra upgrade helps increase efficiency of the network, especially for validators and staking operations, and improves user experience (wallets & accounts).

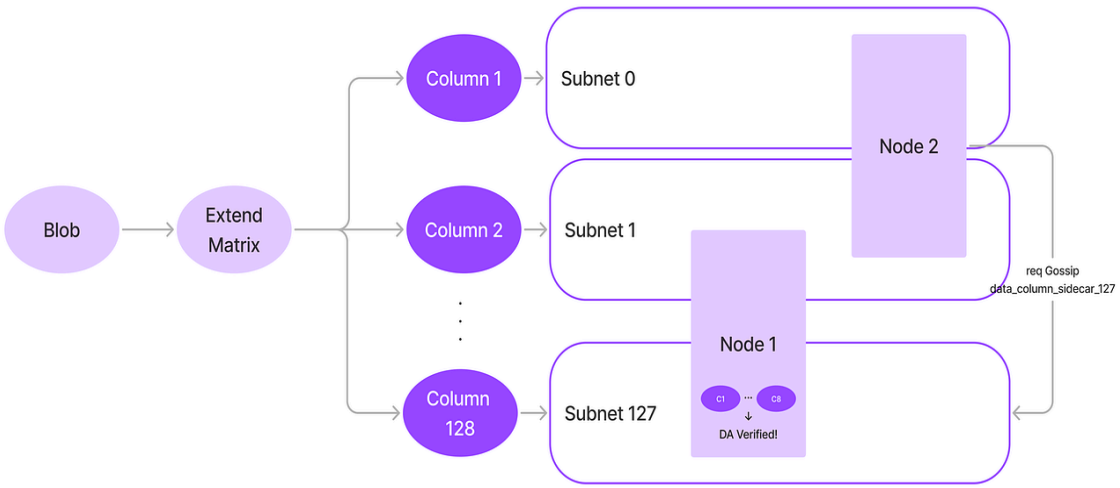
The upcoming Fusaka upgrade targets scalability bottlenecks, especially for L2 networks — so as more transactions shift to rollups, Ethereum's mainnet is being optimized to serve as the base rather than the bottleneck.

For developers / users: This means lower friction, more flexibility in how accounts/wallets work, and over time lower cost for using L2s (which often rely on Ethereum's base layer).
For staking/infrastructure operators: Larger validator caps + more efficient data handling means potentially fewer validators needed, and lower costs for running nodes — which may shift economics.

It also helps Ethereum remain competitive with other smart-contract platforms that are focusing on scalability.

Conclusion
Pectra (May 2025) — major usability & staking improvements.
Fusaka (Next major upgrade on Dec 2025) — focused on scaling/data availability for L2s.

How PeerDAS Work?



Here are the main technical changes to focus on:

Feature	Description	Why it matters for L2s / Ethereum
EIP-7594 – PeerDAS (Peer Data Availability Sampling)	Nodes will no longer need to download full blob data; instead they sample portions to statistically verify data availability. (ref:Cointelegraph+1)	This reduces bandwidth/storage burden on nodes → enables scaling of DA for rollups, lowers barrier to participation, helps decentralisation.
Blob capacity increases	Currently blob limits (target/maximum) are ~6/9 blobs per block; after Fusaka and subsequent Blob Parameter Only (BPO) forks: target/maximum rising to ~10/15 then ~14/21 blobs per block. (ref:MEXC+1)	More blob space = more data throughput for rollups = lower fees, higher throughput for L2s.
Gas limit / throughput improvements	Some reporting shows block gas limit increase (e.g., up to ~150 million units) as part of the upgrade. COIN360+1	Higher gas limit means more transactions per block (subject to other constraints) → helps throughput.
Node efficiency / decentralisation	By reducing the data load on nodes (via PeerDAS), more operators (including smaller ones) can participate without high resource demands. Tekedia	Better node participation = stronger decentralisation, which is a core Ethereum goal.

Ethereum's development trajectory:

usability → scalability → "stateless" clients & full sharding in future.